

Analog Devices' Glossary of Analog Terminology



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-A-

A-law: A European standard for the non-linear digitization of voice signals. Also see (u-law).

A/D Converter (also A/D or ADC): Short for analog-to-digital converter. This device converts real-world analog signals into a digital format that can be processed by a computer. Video-speed A/D converters are those able to digitize video bandwidth signals (greater than 1 MHz). Some are capable of sampling at rates up to 500 million-samples-per-second (MSPs) and beyond. The most common architectures for video-speed A/D converters are "flash" and "subranging" for lower speeds.

A/PC: Auto PC - Windows CD devices for cars

AAC: Analog to Amplitude Converter

AAMI: Association for the Advancement of Medical Instrumentation

AAL: see A7M Adaptation Layer.

AAU: Analog Audio

ABCMOS: Advanced Bipolar CMOS. A semiconductor process designed by Analog Devices that allows analog and digital circuitry to be combined on a single chip. Well suited for A/D and D/A converters.

ABI: Application Binary Interface

ABR: Available Bit Rate

AC: Alternating Current

AC: Audio Codec - reference to AC'97

AC Linearity: A dynamic measurement of how well an A/D performs. In an ideal A/D converter, a pure sine wave on the analog input appears at the digital output as a pure (sampled) sine wave. In the real world, however, spurious signals due to nonlinear distortion within the A/D appear in the digital output. These anomalies are usually combinations of harmonics.

of the fundamental and intermodulation products, produced when the fundamental and its harmonics beat with the sampling frequency. Only the spurious and harmonically-related signals that fall within the A/D's input bandwidth (half the sampling rate) are generally considered important. AC linearity is usually characterized in terms of harmonic distortion, signal-to-noise ratio and intermodulation distortion performance.

AC Link: 5 wire interface standard between DC97, AC97, and MC97

AC'97 versions 1.03, 2.0, 2.1: From Microsoft & Intel. Standards covering audio codecs, controllers, and their communications, aimed at OEMs.

Accelerometer: A sensor used to measure changes in velocity.

Access Protocol: A defined set of procedures that function as an interface between a user and a network and enable the user to employ the services of that network.

ACELP: Algebraic-code Excited Linear Prediction Coding (G.729)

ACI: Adjacent Channel Interference

ACIM: AC Induction Motor

ACPI: From Microsoft & Intel. Power Management Specification.

Acquisition Time: This term relates to sampling A/Ds which utilize a track/hold amplifier on the input to acquire and hold (to a specified tolerance) the analog input signal. Acquisition time is the time required by the T/H amplifier to settle to its final value after it is placed in the track mode.

Active Filter: An active filter is one that uses active devices such as operational amplifiers to synthesize the filter response function. This technique has an advantage at high speeds because the need for inductors (with their poor high-frequency characteristics) is eliminated.

ADC: Analog-to-Digital Converter. A device, usually an IC, that performs analog-to-digital conversions.

Address: A designator identifies a terminal, peripheral device, or any other node on a network.

ADPCM: Adaptive Pulse Code Modulation

ADSL: Asymmetrical Digital Subscriber Line Modem or Asynchronous Digital Subscriber Loop

AEA: American Electronic Association

AEEG: American Entrepreneurs for Economic Growth

AES/EBU: Audio Engineering Society/European Broadcast Union (refers to digital interface)

AFM: Atomic Force Microscope (IR laser to form pits in optical disks)

AGC: Automatic Gain Control

ALC: Automatic Level Control (modem term)

ALDC: Adaptive Lossless Data Compression (IBM term: compression of TCP/IP)

AlGaInP: Aluminum-Gallium-Indium-Phosphide (Solid State Laser 650 Nm)

Algorithm: A fixed set of mathematical calculations and procedures incorporated in software, that program an IC to perform a specific function (e.g., to behave as a GSM cellular phone handset).

Aliased Imaging: This is a technique, commonly applied to Direct Digital Synthesis (DDS), for using intentional aliasing as a source of high-frequency signals. Aliased images appear at 32 MHz, 70 MHz, 83 MHz, etc., which can be used as signal sources when isolated with a bandpass filter.

Aliasing: In a sampled data system, the analog input must be sampled at a rate of at least twice the bandwidth of the signal (i.e., $f_s > 2f_a$) in order to avoid loss of data (Nyquist

Theorem). Adhering to the Nyquist Theorem prevents in-band “alias” signals, which are beat frequencies between the analog signal and the sampling clock that inherently occur. As the Nyquist limit is exceeded, the aliased signals move within the band of the analog input ($DC - f_s/2$) and create distortion. Likewise, high-frequency noise can also be aliased into the input signal range which mandates low-pass filtering, or anti-alias filtering, on the input of a sampled system. It is important to stress that it is *bandwidth* of the signal which matters, not its absolute frequency. In fact, it is possible to sample a band-limited signal located at a high frequency to deliberately generate aliases (“undersampling”). If an alias is located at baseband, the effect of using aliasing as a mixer. See also Aliased Imaging.

ALU: Arithmetic Logic Unit

AM: Amplitude Modulation

AM LCD: Active Matrix Liquid Crystal Display

AM-PSK: Amplitude Modulation with Phase-Shift Keying

AMAX: AM at its maximum

Amplifier: An IC or a piece of equipment that is fundamentally used to produce at its output a larger (i.e., higher voltage and/or higher current) but otherwise exact replica of a continuously varying analog input signal applied to its input. ADI manufactures a wide variety of IC amplifiers that can be used for many different purposes (see Operational Amplifier).

Amplifier function: A PGA can be used in front of an A/D converter to effectively increase its dynamic range.

AMPS: Advanced Mobile Phone Service or Advanced Mobile Phone System

AMR: Audio Modem Riser (from Intel). Specifications covering connector between motherboard and daughter card for audio and modem.

Analog Ground: In high-speed data acquisition applications, system ground is generally physically separated into “analog” and “digital” grounds in an attempt to suppress digital switching noise and minimize its effect on noise-sensitive analog signal processing circuitry. Input signal conditioners, amplifiers, references, and A/D converters are usually connected to analog ground.

Analog Signals: Continuously varying electrical voltages that represent measurable quantities in the real world. For example, a temperature transducer provides an analog output signal that varies in direct proportion to the temperature it is exposed to; the higher the temperature, the higher the voltage.

ANSI: American National Standards Institute

Aperture Delay Time: This term applies to A/D converters, track/hold amplifiers and defines the time elapsed from the application of the “hold” (or “encode”) command until the sampling switch opens fully and the device actually takes the sample. Aperture delay time is a fixed delay time and is normally not an error source since the “hold” clock edge can be advanced to compensate for it.

Aperture Jitter: Uncertainty, or sample-to-sample of variation, in the aperture delay time. Aperture jitter is a source of error in a sampling system. It determines the maximum slew rate limitation of the sampled analog input signal for a given system resolution.

API: Application Programming Interface

ART: Adaptive Recognition Technology

ASCII: American Standard Code for Information Inter-change

ASIC: Application Specific Integrated Circuit. An IC designed to meet the requirements of a specific application, as opposed to single-function, general-purpose devices suitable for a wide variety of applications.

ASK: Amplitude-Shift Keying

ASP: Analog Signal Processor

ASR: Automatic Speech Recognition

ASRC: Asynchronous Sample Rate Converter

ASSP: Application Specific Standard Product

Asymmetrical Digital: A digital communications application.

Asynchronous: A multiplexing and switching technique that organizes information.

ATE: Automatic Test Equipment

ATIS: Alliance for Telecommunications Industry Solutions

ATM: Asynchronous Transfer Mode or Asynchronous Transfer Mode: Mezzanine Bus

ATN: Aeronautical Telecommunications Network

ATRAC: Adaptive Transform Acoustic Coding (Sony)

ATV: Advanced Television (official Name For HDTV)

Audio Codec: Audio coder/decoder. A subsystem-level IC whose primary function is to provide A/D and D/A conversion for enhanced audio (e.g., SoundBlaster compatibility) in a PC. ADI is a major supplier of these devices.

Autocorrelation: Multiplication of a signal with a time-delayed replica of itself.

AVI: Audio/Video Interleave

-B-

B: Byte, 8*bit

b: Bit

B (bearer) Channel: A 64-kb/s ISDN channel whose purpose is to carry digital information between the customer premises equipment and the service provider's switching equipment.

Back end: Collectively, all of the operations in IC manufacturing that take place following wafer fabrication. Includes sawing

the wafer into individual dice (or chips); visual inspection of the chip; fastening the chip in a package, bonding wires from the chip connection points to the leads in the package; closing and sealing the package (or molding one, in the case of plastic packages); electrical testing and grading; and labeling.

Backbone Network: A network that links several smaller networks.

Backgrind: Thinning the wafers just before dicing them up in the packaging process by grinding away at the reverse side of the wafer on a grinding wheel. Wafers must be a certain minimum thickness during processing or they will break too easily. However, if the chips are too thick they become difficult to package.

Balancing Network: Another name for a hybrid, a circuit that connects a two-wire line to a four-wire line and maximizes power transfer while minimizing echo.

Bandwidth: 1) In analog signals, the difference between a signal's lowest frequency component and its highest signal component as measured in Hertz (Hz). 2) The speed of a digital communications circuit in bits per second.

Base Station: The central transmitter in a communications system that acts as the cell hub for communicating with handsets and/or mobile units.

Baseband: The frequency bandwidth of the fundamental signal of interest, i.e., the voice, audio, or video signal bandwidth within a communication system.

Baseband Signal: A digital signal that is not modulated onto a carrier.

Basic ISDN: see Basic Rate Interface.

Basic Rate Interface (ISDN - BRI): A form of the integrated services digital network designed for residential subscribers that operates over the local loop with two B and one D channels.

Baud: A unit of signaling speed that represents the number of discrete conditions or signal events per second on the communications link. When each signal event represents more than one bit, the number of baud does not equal the number of bits per second.

Baud Rate: The speed at which data is transmitted measured in symbols per second. This is not the same as bits per second since each symbol can carry several bits of information.

BCC: see Block Check Character.

Bearer Services: Basic communications services including, but not limited to, voice circuits, 64-kb/s switched data circuits, T1 lines in North America, and E1 lines in Europe.

Bell 103: A North American 300 b/s full-duplex FSK modem standard. The international version is V.1.2.

Bell 202: A North American half-duplex FSK modem standard that operates at 1200 b/s over dial-up telephone lines and 1800 b/s over leased, conditioned lines.

Bell 212A: A North American full-duplex 4PSK modem standard that operates at 1200 b/s and 600 baud. The international version is V.22.

Bell operating Company (BoC): see Regional Bell Operating Company

BER: Bit Error Rate or Bit Error Rate (Ratio). See Error Rate.

BESOI: Bonded & Etchback Silicon on Insulator (Bonded Wafer)

BICMOS IC Process: A semiconductor process designed by Analog Devices that allows bipolar and digital CMOS circuitry to be fabricated on the same chip. Used for mixed-signal ICs, such as A/D and D/A converters.

BIFET: Bipolar Field Effect Transistor

BIMOS: Bipolar Metal Oxide Semiconductor

Binning: Classifying chips by their performance (usually

speed) - the analogy is to physically drop things into different bins. This happens at the final test. Once the chips have been packaged, they are tested one more time to see if they work and how well they perform.

Binary Phase-Shift Keying (BPSK): A modulation scheme that uses two phases to represent data. One phase represents a mark, and the other phase represents a space.

Binary Synchronous Communications Protocol (BISYNC):
A character-oriented protocol developed by IBM.

BIOS: Basic Input Output System

Bipolar IC Process: A semiconductor process that uses both NPN and PNP transistors. Bipolar processes are very good for fabricating linear ICs like amplifiers, but are not optimal for mixed-signal or digital devices.

BISYNC: see Binary Synchronous Communications Protocol.

BISDN: Broadband integrated services digital network

Bit: Binary Digit. The smallest information unit used in data communication. It has two possible states, 0 or 1. Bit is a contraction of the words "binary digit."

Bit Error Rate: see Error Rate.

Bit Rate: The rate of transfer of information necessary to ensure satisfactory reproduction of the information at the receiver.

Bit Stream: A continuous series of bits transmitted over a communications link.

Bit-Oriented Protocol: A set of rules for communicating data that divides each block of data into bit fields. Each bit field serves a purpose in the protocol.

BJT: Bipolar Junction Transistor

Block Check Character (BCC): An extra data word added to the end of a data transmission to aid in error detection. Also called Binary Check Character.

BNC: Bayonet Neil-Councilman Connector

BOC: Bell Operating Company. See Regional Bell Operating Company (RBOC).

BONDING: Bandwidth On Demand Interoperability

BPSK: Bi-Phase Shift Keying or Binary-Phase-Shift-Keying

BRI: Basic Rate Interface for ISDN.

Bridge: A device that operates at OSI Model levels 1 and 2 to connect two or more LANs of the same type.

Broadband: A communications channel that has a bandwidth greater than 64 kb/s and can provide higher speed data communications than a standard telephone circuit. Also called wideband.

Broadcast: The process of sending a message from one station to all other stations on the network.

Router: A device that performs the functions of both a bridge and a router (X.25 network product).

BSDL: Boundry Scan Descriptive Language

BST: Boundary Scan Testing

BTL: Backbone Transceiver Logic (IEEE standard 1194.1: Reduced Voltage Swing)

BTL: Bridged Tied Load. Expression for a speaker balanced output configuration.

BTU: British Thermal Unit

Buffer Amplifier: A unity gain amplifier used to isolate the loading effect of one circuit from another. Buffer amplifiers are almost always used between the signal source and the input of a high speed A/D converter.

Built-in modem: A modem integrated into the motherboard of a terminal or computer.

Burst: Several events that occur within a short period of time.

Burst Error: A series of consecutive errors in a data transmission.

Bursty: A characteristic of most data communications networks. Bursty refers to the fact that the bandwidth needed for data communications varies greatly from one moment to the next.

Bus: A set of conductors connecting the various functional units in a computer.

Bus Network: A network topology that uses a single communications link to connect three or more terminals. Also called a Multi-Drop Network.

Byte: A group of eight bits that is processed as a single logical unit.

-C-

C-4: Controlled Collapse Chip Connection. Solder balls on the chip form the leads for connection. See also BGA - Ball Grid Array.

C-QUAM: Motorola's Stereo AM Radio Standard.

Cable Telephony: The practice of using digital communications techniques to provide enhanced home telephone service via the existing home cable-TV connections. The bandwidth of cable is high enough to simultaneously supply interactive cable TV, telephone communications, and on-line data services. In this scenario, the cable connection becomes the primary link to the information highway vs. twisted pair telephone wire or a wireless connection.

CAD: Computer Aided Design

CAE: Computer Aided Engineering

CAGR: See Compound Annual Growth Rate.

Call-Setup Time: The time required to establish a connection between two terminals on a switched communications network.

CAM: Computer Aided Manufacturing or Content Addressable Memories

CAP: Carrierless Amplitude/Phase Modulation (Paradyne)

Carrier Sense Multiple Access with Collision Detection

(CSMA/CD): A protocol that Ethernet and some other LANs use to allow nodes to contend for the right to transmit over the network.

Carrier System: A method of obtaining several communications channels over a single communications link by multiplexing the channels together at the transmitting end and demultiplexing them at the receiving end.

CBCMOS IC Process: Complementary Bipolar CMOS. A semiconductor process designed by Analog Devices that allows high-performance analog and digital circuitry to be combined on a single chip. Well suited for mixed-signal devices such as A/D and D/A converters.

CBGA: Ceramic Ball Grid Array

CBR: Continuous Bit Rate (Asynchronous Transfer Mode)

CCD: Charged Coupled Devices

CCFL: Cold Cathode Fluorescent Lamp

CCGA: Ceramic Column Grid Array

CCITT (Comite Consultatif International Telegraphique et

Telegraphique): The original French name of the committee that published international communications standards. Replaced by ITU.

CD (Critical Dimension): The minimum width that is allowed as part of the circuit design, on any given patterning layer. The CDs on real wafers can vary from lot to lot because of minor process variations. The monitoring and control of the CDs for some of the critical layers (like polysilicon and metal) is vital for any fab. This is because the CDs can have a profound effect on how fast the chips work and if they function at all.

CD: Compact Disc

CD ROM: Compact Disk Read Only Memory

CDC: Compact Digital Cassette

CDDI: Copper Distributed Data Interface

CDMA: Code Division Multiple Access. Also known as spread spectrum, allowing several users to share a channel by allocating "codes" that allow each one to distinguish between them, even though they use the same frequency bands at the same time.

CDMA TDMA: Composite CDMA/TDMA, Air Interface For Large Cells

CDPD: Cellular Digital Packet Data

CDS: Correlated Double Sampler

CECC: Cenelec Electronic Components Committee

Cell: An ATM packet that is 53 bytes in length with a 5-byte header and a 48-byte payload.

CELP: Code Excited Linear Prediction (AT&T/DOD Developed 4.8 kbps), 105 Msec delay.

CENELEC: European Committee For Electrotechnical Standardization

Central Office (CO): The location where a local telephone company terminates subscriber lines and provides switching equipment to interconnect them. Also called an exchange, end office, or local central office.

Centrex: A service offered by telephone companies that uses central office equipment to provide features comparable to those provided by a PBX.

CEPT: Conference for European Post & Telecommunications

CERIP: Ceramic Dual Inline Package

CFI: CAD Framework Initiative

Chain: A series of store-and-forward nodes through which a packet must pass when it is sent from one terminal to another on some packet-switched networks such as X.25.

Channel: A transmission path between two communicating locations. A channel is usually the smallest subdivision of a transmission system, commonly 64 kb/s.

Character-Oriented Protocol: A set of rules for communicating data that relies upon special characters, such as SOH, STX and ETX, to control the flow of information. BISYNC is a character-oriented protocol.

Cheapernet: see IOBASE-2

Checksum: A block check character that is formed by taking the sum of the binary data transmitted.

Chip: An individual integrated circuit chip. Technically, it refers to an IC chip by itself that is not in a package, but this term is also sometimes used to refer to packaged devices.

Chip Rate: In spread spectrum systems, this is the rate at which the pseudo-random noise code is applied. In frequency hopping systems, chip rate is the inverse of the dwell time which the output frequency occupies a single carrier frequency. Also called "chipping rate."

Chip Set: A set of integrated circuits that supply all or most of the circuitry needed to build an item of electronic equipment. Most modems and computers are built from chipsets.

Chirp: Pulsed frequency modulation scheme in which a carrier is swept over a wide frequency band during a given pulse interval.

CIM: Computer Integrated Manufacturing

Circuit Switching: A method of establishing a dedicated communications path between two or more locations through one or more switching nodes. Data is sent in a continuous stream; the data rate is constant; the delay is constant and limited to propagation times; and a dedicated end-to-end

path remains in effect until the communication is terminated. Contrast with packet switching.

CISC: Complex Instruction Set Computer

CLCC: Ceramic Leaded Chip Carrier

Client-Server Network: A network that uses a central computer (server) to store data that is accessed from other computers on the network (clients).

Cluster Tool: A machine which contains more than one process module. This is particularly useful if there are a number of processes which have to happen in sequence. An example of this is the deposition of a multi-layer metal film with each layer being deposited in a different module (chamber). Cluster tools nevertheless represent savings in cost and space even if all the process modules are identical.

CMI: Code Mark Inversion (155 SONET coding scheme that translates $DC > 155 \text{ MHz}$ to $77.5 > 155 \text{ MHz}$).

CMIP: see Common Management Information Protocol.

CMOS: see Complementary Metal Oxide Semiconductor. A semiconductor process technology originally developed for use in fabricating digital ICs.

CMTL: Current Mode Transceiver Logic (Motorola standard for point-to-point interface).

CMYB: Cyan, Magenta, Yellow, Black

CO: see Central Office.

Coax: see Coaxial Cable.

Coaxial Cable (Coax): A tubular wire transmission medium that consists of a central conductor surrounded by a dielectric insulator that is in turn surrounded by a tubular conductor. The outer conductor is usually at ground potential and also serves as an electrical shield.

COB: Chip On Board (IC chip mounted directly on PC board).

Code: A system of using symbols to represent other information. ASCII and EBCDIC are two binary codes used in data communications.

CODEC: Coder/decoder. A single integrated circuit that contains both an analog-to-digital converter (ADC) and a digital-to-analog converter (DAC). A CODEC performs both pulse code modulation and demodulation.

COFDM: Coded Orthogonal Frequency Division Multiplexed (Europe/Japan HDTV Standard)

Cold Wall Reactor: A machine (usually CVD machine) in which the wafers are heated directly rather than through the walls like in a furnace. This can be done by shining a light on the wafers, exposing them to electromagnetic energy, or mounting them on heated plates. The walls of the reactor are then at a lower temperature than the wafers.

Collision: A contention situation in the CSMA/CD protocol that occurs when two nodes attempt to transmit simultaneously.

Combinational Network: A network that uses more than one topology. A combinational network often results when several previously independent networks are linked.

Common Carrier: A company that sells communications services to any member of the public.

Common Channel Signaling: A method of using a single signaling channel to carry signaling information relating to a number of information channels. Common channel signaling information is sent in packet form. See Signaling System 7. Contrast with In-Band Signaling.

Common Channel Signaling System 7: see Signaling System 7.

Common Management Information Protocol (CMIP):

An OSI protocol for the exchange of network management information that provides the means to request actions and

report events but does not specify what those actions and events are.

Communications Architecture: A combination of hardware and software that implements some communications functions. See Architecture.

Communications Port: A connection on a terminal through which data is input and/or output.

Companding: A process in which compression of a signal at one point in a system is later followed by expansion to restore the original volume range. When companding is used for noise reduction in a communication system, compression is applied before exposure to a noisy channel and expansion after the exposure.

Complementary Metal Oxide Semiconductor (CMOS): A semiconductor field effect transistor (FET) technology in which both n-channel and p-channel devices are fused together.

Compound Annual Growth Rate (CAGR): The average growth per year, usually expressed as a percentage.

Compression: see Data Compression.

Compression Ratio: The ratio of the number of bits required to represent the original information to the number of bits required to represent the compressed signal.

Computer Chips: A lay term used to describe integrated circuits. Usually refers collectively to any or all of the chips in a computer, typically a PC. There is no one chip identified as a "computer chip," but a PC's microprocessor IC probably comes closest.

Concentrator: A hub-like device used on some FDDI networks to connect several single-attached nodes to the network.

Conditioned Line: A telephone circuit that has had its frequency response and/or delay characteristics optimized.

Conditioning: Applying electronic filtering to a communications link to improve its ability to support higher communications speeds. Also see Equalization.

Conference for European Post and Telecommunications (CEPT): A European telecommunications standards committee.

Connection Identifier: A part of the header information in an ATM cell that associates the cell with a given virtual channel. The connection identifier is used by network nodes for multiplexing, demultiplexing and switching.

Connectionless Protocol: A packet switched protocol that permits a terminal to send data through the network without first establishing a virtual connection to the receiving terminal.

Connection-oriented Protocol: A packet switching technology, such as ATM, that can establish a virtual circuit between transmitting and receiving terminals so that it appears that the terminals are connected by a switched circuit with a fixed bandwidth. Connection oriented protocols, unlike other packet switching technologies, can be used to send information that requires a constant delay and bandwidth, such as voice and video.

Contention: A method of line control in which terminals compete with each other for permission to transmit over a common channel. If the channel is free, the terminal transmits. If the channel is in use by another terminal, the terminal attempting to transmit waits until the channel is free.

Converter: See A/D Converter and D/A Converter

COTS: Commercial Off The Shelf (military term for using standard products).

CPE: see Customer Premises Equipment.

CPFSK: Continuous Phase Shift Keying

CPGA: Ceramic Pin Grid Array

CPLD: Complex Programmable Logic Devices

Glossary of Analog Terminology

CQFP: Ceramic Quad Flat Pack

CRC: see Cyclic Redundancy Check.

Crosstalk: The unwanted transfer of energy from one communications circuit to another.

CRPWM: Current Regulated Pulse Width Modulator

CSDN: Circuit Switched Digital Network

CSMA/CD: Carrier Sense Multiple Access/Collision Detection

CSU: Customer Service Unit

CT: Current Transformer

CT2: Cordless Telephone, 2nd Generation

CTI: Computer Telephony Integration

CTT: Center Tapped Termination (High Speed I/O Scheme)

Customer Premises Equipment: The apparatus at the subscriber's location that permits the subscriber to use a telephone line or other communications service.

CV: Capacitance Voltage

CVD: Chemical Vapor Deposition. Deposition of thin films (usually dielectrics/insulators) on silicon wafers by placing the wafers in a mixture of gases which react at the surface of the wafers. CVD can be done at medium to high temperature in a furnace, or in a CVD reactor in which the wafers are heated but the walls of the reactor are not. Plasma enhanced CVD avoids the need for a high temperature by exciting the reactant gases into a plasma. High-density plasma CVD (HDPCVD) is a new technique which is good for getting dielectrics into narrow gap.

CW: Continuous Wave

Cyclic Redundancy Check (CRC): A type of block check character that is very effective in detecting communications errors. CRC characters are usually 12, 16, 24, or 32 bits long.

CZT: Chirp Z Transform

-D-

D (data) Channel: A 16-kb/s or 64-kb/s ISDN channel. Its primary purpose is to carry signaling information between customer premises equipment and the service provider's switching equipment. It can also carry low speed data in packet form. Also see B Channel.

D/A Converter: (Also D/A or DAC.) Short for digital-to-analog converter. This is a device that changes a digitally-coded word into its "equivalent" quantized analog voltage or current. Just like the A/D device, there are very high-speed D/As available, capable of converting at data rates up to 1 GHz.

D2PAK: Large (to 220) Power Transistor Package For Surface Mount

DAA: Direct Access Arrangement (Telephone PSTN term)

DAB: Digital Audio Broadcast

DAC: Digital-to-Analog Converter

DAG: Data Address Generator

DAM: Digital Answering Machine

DAR: Digital Audio Radio

DARPA: see Defense Advanced Research Projects Agency.

DAT: Digital Audio Tape

Damascene Process: A way of making metal lines which involves depositing an insulator (oxide), etching a trench in the oxide, depositing metal everywhere and then polishing back with CMP so there is just metal left in the trench. This is the opposite of the traditional sequence which has metal being deposited first, the metal being patterned through etching, and the oxide being deposited to try to fill the gaps between the metal. Damascene processing removes the gap fill problem (getting oxide between the metal lines). It also results in a different distribution of processes used in the fab that it uses an oxide etch instead of a metal etch,

and a metal CMP step instead of an oxide CMP step.

DAS: Data Acquisition System. A single IC, a combination of ICs, or a piece of equipment used to acquire analog data, typically from real-world sensors (e.g., temperature transducers). Usually includes amplifiers for increasing weak signals, a multiplexer to select among multiple signal sources, a sample-and-hold amplifier to hold an analog signal constant during A/D conversion, and an A/D converter.

DAT: Digital Audio Tape

Data Base: An integrated collection of information that supports multiple applications and often multiple users.

Data Communications Equipment (DCE): A device that modulates digital signals onto an analog carrier for communications over an analog communications link, or which demodulates received analog signals to recover the digital information. Usually a modem.

Data Compression: A method of reducing the number of bits that are needed to represent information. Data compression allows higher communications speeds and allows more information to be stored on a disk.

Data Management: Software that manages the storage, retrieval, security, and integrity of information.

Data Memory: Region of memory in which 32-bit data words and 16-bit short words are stored; implies that the DM bus is used for accesses.

Data Pump: The analog front end and basic DSP circuits of a modem that handle analog-to-digital and digital-to-analog conversion and signal modulation and demodulation. The data pump requires a microcontroller and a data access arrangement to make a complete modem.

Data Rate Adaptation: A feature of the data service unit (DSU) in the switched-56 service that allows the service to be used with terminals that operate at speed other than 56 kb/s. Data

rate adaptation is the conversion between which clocking scheme and speed the terminal uses and the 56 kb/s synchronous clocking of the switched 56 line.

Data Service Unit (DSU): A device (sometimes called a “digital modem”) that connects a private network, video conferencing console, computer, or other terminal device to a switched 56 line. The DSU handles the protocol and speed conversion between the terminal and the 56 kb/s digital telephone line.

Data Set: Telephone company jargon for a modem.
See Modem.

Data Superhighway: see National Information Infrastructure.

Data Terminal Equipment (DTE): A device that converts data from the parallel format used within a terminal to the serial format used on a communications link. A UART is a type of DTE. Also see UART.

Datalink Layer: Layer 2 of the OSI Model. It defines effort control, framing, synchronization, link initialization and disconnection, addressing and frame sequence control.

DAVIC: Digital Audio Visual Council (Audio visual application services for broadcast)

DAVID: Digital Audio/Video Interactive Decoder (API developed by Microware)

dB: see Decibel.

DBS: Direct Broadcast Satellite

DC: Direct Current

DC: Digital controller - reference to AC '97

DCAHA: Data Compression Adaptive Hoffman Algorithm

DCASP: Digital Controlled Analog Signal Processor

DCC: Digital Compact Cassette (Philips & Masushita format)

DCE: Data Circuit Terminating Equipment

DCFL: Direct Coupled Field Effect Transistor Logic

DCPSK: Differentially Coherent Phase Shift Keying

DCS: Distributed Control Network

DCS 1800: GSM standard for 1.8GHz

DCS 1900: GSM Standard for 1.9GHz, for USA market

DCS TDMA: 8 time slot TDMA air interface for licensed appl.
base on DCS-1800

DCT: Discrete Cosine Transform

DCT TDMA: 12 Time Slot TDMA air interface, for small
cells, based on DECT standard

DDD: see Direct Distance Dial Network

DDG: Digital Delay Generator

DDS: Direct Digital Synthesis

Debug: Originally used to describe the process of finding and
correcting errors in circuitry and computer programs, but is
also used in a broader sense to refer to working out or solv-
ing a problem.

Decibel (dB): A unit for measuring the relative strength of sig-
nal power. The number of decibels equals ten times the log-
arithm (to the base 10) of the ratio of the measured signal
power to a reference power. One-tenth of a bell.

DECnet: Digital Equipment Corporation's family of network
products.

DECT: Digital European Cordless Telephone: For Wpabx
applications

Deep UV: Deep Ultraviolet. A range of light colors, far beyond
what humans can see on the violet side of the spectrum.
This is the type of light which we believe will be needed for
the 0.25 and 0.18 micron generations of semiconductor
photolithography. Deep UV light can be obtained from
excimer lasers.

Defense Advanced Research Projects Agency (DARPA): A US Department of Defense Agency that funds high-risk research projects and that funded the development of UNIX 4.2, and the TCP/IP communications protocol. One of the founders of the Internet.

Demultiplexing (DEMUX): The process of separating a multiplexed signal into its separate intelligence signals.

DEMUX: see Demultiplexing.

DET: Digital Entertainment Terminal (General Instrument term for a set top box).

DFMA: Design for Manufacture & Assembly

DFMEA: Design Failure Modes and Effects Analysis

DFT: Design For Testability

DFT: Discrete Fourier Transform

Die: (Plural is dice.) An individual IC chip. Usually refers to IC chips at the time a wafer is sawed or cut into individual IC chips. Each wafer contains many devices of the same type, which after fabrication are cut or sawed into individual chips.

Die Attach: Attaching a die to its mount in its package. This is often done with a metal-based glue-like silver epoxy for good conduction of heat away from the chip. Chips get hot when they are running in normal operation, so packages must be designed to help dissipate the heat.

Differential Nonlinearity (DNL): In an ideal D/A and A/D converter, any two adjacent digital codes should result in measured output (or input) values that are exactly one LSB apart. Any positive or negative deviation in the measured "step" from the ideal differences is called differential nonlinearity. It's expressed in (sub) multiples of 1 LSB. DNL errors more negative than -1 LSB mean the slope of the curve has a dip, as an increase of 1 bit in input leads to a decrease in output value. This is "non-monotonic" and can cause serious problems in system applications.

Digital: Refers to a way of handling information by representing it in combinations of two-state signals, one of which represents a "zero" and the other a "one" the language of computers.

Digital CMOS IC Process: A CMOS semiconductor process used to fabricate ICs that have only digital circuitry, such as microprocessors and DRAM (memory) ICs. ICs that contain only digital circuitry, such as microprocessors, DRAM (memory) and DSP ICs.

Digital Down Conversion (also Direct-IF-to-Digital conversion): This refers to a demodulation technique for sampling an intermediate frequency (IF) signal with a wide-bandwidth A/D whose sampling rate is equivalent to the local oscillator frequency ($< \text{IF frequency}$). In this super-Nyquist application, the A/D serves as the mixer stage and its digital output data is a beat frequency; the modulation data can be recovered with a DSP stage.

Digital Filtering: The process of smoothing, spectrally shaping, or removing noise from a signal has traditionally been accomplished with analog components. With the advent of high speed DSP products, now filtering can effectively and economically be accomplished in the digital domain. Digital filters are basically mathematical functions that are performed on the digital data stream and their characteristics can be altered under software control which adds to their overall flexibility. Finite Impulse Response (FIR) and Infinite Impulse Response (IIR) are examples of digital filter functions.

Digital Signal Level 1 (DS-1): The 1.544 Mb/s T1 digital telephony rate.

Digital Signal Level 3 (DS-3): The 44.7 Mb/s T3 digital telephony rate.

Digital Signal Processor (DSP): A device similar to a microprocessor but which is specifically designed to process digitized analog signals in real time.

Digital Superhighway: see National Information Infrastructure.

Digital Systems Interface: A chip-to-chip interface for ISDN modules supported by National Semiconductor and SGS-Thompson.

DIP: Dual Inline Package

Direct Digital Synthesis (DDS): A process by which you can digitally generate a frequency-agile, highly-pure sine wave, or arbitrary waveform from an accurate reference clock. The digital output waveform is typically tuned by a 32-bit digital word which allows sub-Hz frequency agility. The DDS's frequency output is normally reconstructed with a high-speed, high-performance D/A to generate an analog output signal. The ability to add internal functions, such as phase modulation, amplitude modulation, digital filtering, and I&Q outputs, are making DDS devices attractive for digital communication applications. They serve in applications such as modulators, local oscillators, and clock detect/recovery circuits.

Direct Distance Dial (DDD) Network: A telephone network to directly dial long distance telephone calls.

Discrete Component: Within the semiconductor industry, this refers to a single semiconductor device, such as a diode or a transistor. Most of the semiconductor industry's sales consist of ICs, which combine hundreds, thousands or even millions of components on a single IC chip.

Dither: The technique of adding controlled amounts of noise to a signal to improve overall system loop control or to smear quantizing error in an A/D converter application.

DLA: Defense Logistics Agency

DLL: Dynamically Linked Library

DM: Delay Modulation

DMA: Direct Memory Access

Glossary of Analog Terminology

DMD: Data Memory Data or Digital Micro-Mirror Devices
(TI Development)

DMOS: Double Diffused Metal Oxide Semiconductor

DMR: Digital Mobile Radio

DNL: Differential Non-Linearity

DNR: Digital Noise Reduction

DoD: Department of Defense

DoDISS: Department of Defense Index of Specs and Standards

DoDSSP: Department of Defense Single Stocking Point

Dopant: Tiny amounts of impurities can change the electronic properties of the silicon, affecting greatly how it conducts electric current. Selected impurities called dopants are deliberately introduced into the silicon to create devices such as transistors. Typical dopant concentrations in silicon range from one part in a thousand to one part in ten million. Phosphorus, arsenic and boron are the most common dopants used for silicon.

Dopant Profile: The way dopant concentration varies with depth from the surface of the wafer. The speed at which a transistor operates (and indeed whether the transistor works at all) is very much affected by the dopant profile.

DPAK: Small Power Transistor Package For Surface Mount

DPCM: Differential Pulse-Code Modulation

DPSK: Differential Phase-Shift Keying

DQPSK: Differential Quadrature-Phase-Shift-Keying

DRAM: Dynamic Random Access Memory

DRO: Dielectrically Resonant Oscillator

Drop: A connection between a terminal and a subscriber.

DS: Direct Sequence (Wireless LAN spread spectrum transmission term)

- DS-1:** see Digital Signal Level 1.
- DS-3:** see Digital Signal Level 3.
- DSI:** see Digital Systems Interface.
- DSK:** Downstream Keyer
- DSL:** Asymmetrical Digital Subscriber Line or Digital Subscriber Line
- DSMS:** Direct Sequence Modulated System
- DSO:** Digital Sampling Oscilloscope
- DSP:** Digital Signal Processing or Digital Signal Processor
- DSPEC:** DSP Evaluation Cooperative
- DSSP:** Digital Sensor Signal Processor
- DSSS:** Direct Sequence Spread Spectrum
- DSU:** Data Service Unit
- DSVD:** Digital Simultaneous Voice & Data (modem that can handle both).
- DSX:** Digital Signal Cross-Connect
- DTA:** Design & Test Alliance
- DTAM:** Digital Telephone Answering Machine
- DTCP:** Dual Tape Carrier Package
- DTE:** Data Terminal Equipment (Telephone term for equipment hooked up to PSTN)
- DTMF:** Dual Tone Multiple Frequency (Telephone Touch Phone) or Dual-Tone Multifrequency Signaling
- DTW:** Dynamic Time Warping (Speech recognition term)
- Dual-Attach Node:** An FDDI terminal that connects to both the primary and secondary nodes. A dual-attach node has two input ports and two output ports.
- Dual-Tone Multi-Frequency Signaling (DTMF):** A system of tones used as dialing signals in the telephone network.

Also known by the trademark Touch Tone.

DULOO Modem Pool Element: A device market by Motorola that allows users of the switched-56 service to communicate with analog modems at speeds of up to 9600 b/s.

DUT: Device Under Test or Dual Use Technology

DVD: Digital Video Disk

DWMT: Discrete Wavelet Multi-Tone

DWT: Discreet Wavelet Transform or Discrete Wavelet Tone

Dynamic Range: The ratio of the maximum output signal to the smallest output signal that can be processed in a system. Usually expressed logarithmically in dB. Dynamic range can be specified in terms of harmonic distortion, signal-to-noise ratio, spurious-free dynamic range, or other AC input-based performance criteria.

Dynamic Router: A router that automatically broadcasts routing information throughout the internet network at regular intervals. Other dynamic routers use this information to update their routing tables in case any changes have been made to the network.

-E-

E-mail: see Electronic Mail.

EABI: Embedded-Application Binary Interface

EBCDIC: see Extended Binary Coded Decimal Interchange Code.

EBS: Emergency Broadcast System

Echo Cancellation: A circuit that uses DSP technology in a full-duplex communications node to remove echoes of the transmitted signal from the received signal.

Echo Distortion: A telephone line impairment caused by electrical reflections (echoes) where line impedances are dissimilar.

ECL: Emitter Coupled Logic

ECOC: Edge Contrast Oriented Coding

ECTF: Enterprise Computer Telephony Forum

ECTF: European Computer Manufacturers Association

EDA: Electronic Design Automation

EDAC: Electronic Design Automation Companies

EDI: Electronic Data Interchange

EDIF: Electronic Design Interchange Format

EEPROM: Electrically Erasable Programmable Read Only Memory

EFTA: European Free Trade Association

EISA: Extended (32 Bit) Industry Standard Architecture PC-AT Bus

Electronic Mail: Electronic messages that can be sent over a communications network from one computer to another.

EMI: Electromagnetic Interference (Emission)

Encoding: The process of putting information into digital format.

Encryption: A technique of modifying a bit stream to make it appear to be a random sequence of bits to someone who does not have access to the encryption scheme.

End Office: see Central Office.

ENOBs: Effective Number of Bits. ENOBs are a measure of an A/D's dynamic performance as compared to that of a theoretically perfect A/D transfer function. ENOBs are calculated by the formula: $(\text{ENOB} = \text{SNR Actual} - 1.76 \text{ dB}) / 6.02$. A high-speed A/D with 10-bits of resolution typically will be less than 9 ENOBs of dynamic performance at a Nyquist analog input bandwidth.

Envelope Delay: A type of distortion on an analog line where the signal delay varies with signal frequency.

EOS: Electrical Overstress

EOTC: European Organization for Testing and Certification

EPA: External Port Address

EPAC: Electronically Programmable Analog Circuit

EPD: External Port Data

EPLD: Erasable Programmable Logic Device

EPI: Epitaxial. The deposition of a thin film of silicon on a silicon wafer, in such a way that the deposited layer forms a single continuous crystal with the underlying wafer. This method is used to create a high quality, low sloped surface in which to make transistors and other devices on top of a highly doped substrate with a low electrical resistance.

EPROM: Electrically Programmable Read Only Memory or Erasable Program Read Only Memory. Allows stored information to be erased by exposure to ultraviolet lights, allowing new information to be re-programmed into the device.

Equalization: Compensation for frequency dependent attenuation in a communications circuit. Its purpose is to provide an equal signal attenuation over the circuit's full frequency range. See Conditioning.

Error Control: A method of detecting and correcting errors within a block of received data.

Error Rate: The ratio of the number of data units received in error to the total number of data units. Also called Bit Error Rate (BER).

ESD: Electro Static Discharge

ESDS: Electro Static Discharge Sensitive Devices

ESMR: Enhanced Specialized Mobile Radio

ESR: Effective Series Resistance

ET: see Exchange Termination.

Ethernet: A LAN standard, also known as IEEE 802.3, that connects personal computers by means of coaxial cable or twister-pair conductors. Most Ethernet LANs operate at 10 Mb/s.

ETL: Enhanced Transceiver Logic (TTL Voltage Levels, 90 mA Output Drive)

ETSI: European Telecommunications Standardization Institute

Euro ISDN: see Eurofile Transfer Standard for ISDN.

Eurofile Transfer Standard for ISDN (Euro ISDN): An international ISDN standard for Europe that is presently being installed and will eventually replace individual European national ISDN standards.

Exchange: see Central Office.

Exchange Area: A geographical area with which there is a uniform set of charges for a communications service. In a telephone system, a call between any two points within an exchange area is a local call.

Exchange Termination (ET): An ISDN interface located in the telephone company central office switch.

Excimer Laser: A type of laser which produces light in the deep ultraviolet range (deep UV) suitable for 0.25 micron and 0.18 micron generation semiconductor technologies. The word "excimer" is a contraction of the term excited dimmer, which means that the laser creates light from excited two component gases.

Extended Binary Coded Decimal Interchange Code (EBCDIC): An 8-bit code that was developed by IBM Corporation and is widely used for the communication and storage of text information.

Extended Passive Bus: see Passive Bus.

External Bus: DATA 47-0, ADDR 31-0, RD, WR, MS3-0, BMS, ADRCLK, PAGE, SW, ACK, and SBTS signals.

External Port FIFO Buffers: EPB0, EPB1, EPB2, and EPB3 – the IOP registers used for external port DMA transfers and single-word data transfers (from other ADSP-2106xs or from a host processor). These buffers are 6-deep FIFOs.

-F-

Facility: A transmission path between two or more locations without terminating or signaling equipment.

Facsimile (Fax): A communications terminal for the transmission of graphics and documents over standard analog dial-up telephone lines.

FASIC: Function & Algorithm Specific Integrated Circuit. A system-level IC designed to perform a specific function; it includes read-only software that directs the IC in performing that function. This is an emerging term that is usually applied to devices that contain a DSP core, as well as any necessary digital and analog circuitry.

FAST: Frequency Agile Sharing Technology

Fax: see Facsimile.

FCC: A US federal government agency made up of seven commissioners appointed by the president that has the power to regulate all radio communications and all interstate electrical communications within the US and all electrical communications between the US and other countries.

FDD: Frequency-Division Duplex

FDDI: see Fiber Data Distributed Interface.

FDM: see Frequency-Division Multiplexing.

FDMA: Frequency-Division Multiple Access. Each conversation gets its own, unique, radio channel. This is the system used by analog cellular.

FDX: Full Duplex

FEC: Forward Error Correction

FET: Field Effect Transistor

FFC: Fabric FIFO Controller

FFDI: FDDI Full Duplex Technology

FFT: Fast Fourier Transform. A computationally efficient mathematical technique that converts digital information from the time domain to the frequency domain for rapid spectral analysis. FFTs generally utilize a "time weighting" function to compensate for data records with a non-integer number of samples; some popular weighting functions are Hanning Window and 4-term Blackman-Harris.

FH: Frequency Hopping (Wireless LAN spread spectrum transmission term)

FIB: Focused Ion Beam Lithography

Fiber Data Distributed Interface (FDDI): A line standard that uses fiberoptic cable or twisted-pair wire to connect computers. FDDI LANs operate at 100 Mb/s.

Fiber Optics: A transmission medium consisting of thin strands of glass or plastic through which data is sent by means of pulse modulated light waves.

Field: Since a photolithographic stepper cannot accurately deal with imaging the microscopic circuit features over all of a wafer at one time, it exposes an area it can easily manage. This is called a field. The stepper will keep moving the wafer and exposing a new area the size of a field till the whole wafer is done (about 80 fields on an 8 inch wafer).

FIFO: see First-In, First-Out Memory.

File Server: see Server

Filter: An electrical circuit that passes frequencies within a specified frequency band and attenuates signals that fall outside of that frequency band.

FIP: Factory Information Protocol

FIR: Finite Impulse Response Filter

Glossary of Analog Terminology

Firmware: A set of software instruction placed in a read-only memory (ROM).

First-In, First-Out (FIFO) Memory: A type of memory with separate input and output ports. The first data to enter the input port are the first to exit the output port. One use of FIFO memory is as a buffer between a terminal and a LAN in a network interface controller.

Flash Memory: An IC which has the ability to bulk erase its entire contents simultaneously. It shares the advantage of other nonvolatile memory in that it retains information when power is off. Its ability to repeatedly and rapidly erase and re-program information makes it competitive with DRAMs or disk drives for storing data, although flash is more expensive. Flash is a rapidly growing market.

FLCD: Ferroelectric Liquid Crystal Display

Flow Control: A function performed by a receiving terminal to regulate the rate data is sent to it by a transmitting terminal.

FM: Frequency Modulation

FM synthesis: Scheme for generating sounds based on Frequency Modulation.

FMEA: Failure Modes and Effects Analysis

FOB: Freight On Board or Free On Board

Footprint: The area a machine takes up in the clean room. This is important because clean room space is expensive, and so minimizing the footprint of a machine is a good thing to do. There are two numbers that semiconductor manufacturers are interested - the footprint and the linear frontage number (length of the front of the machine). The linear frontage number affects how many machines will fit into a bay since the machines are all lined up side by side.

Format: A specified arrangement of data that permits identification of control and information content.

Forward Error Correction (FEC): Any system that allows a terminal to both detect and correct errors in received data.

Foundry: An independent company that performs wafer fabrication services for IC companies. Foundries typically do not perform any design and usually run industry-standard sub-micron digital CMOS processes.

Four-Wire Circuit: A full-duplex communications channel where transmission occurs over one pair of wires and reception occurs over a separate pair.

FPD: Flat Panel Display

FPGA: Field Programmable Gate Array

FQFP: Fine Pitch Quad Flat Pack

Fractional T1: A portion of the bandwidth of a T1 carrier system that can be separately leased.

Frame: A sequence of time slots in ISDN. A basic rate interface frame consists of 48-bit time slots repeated every 250 μ s. A primary rate interfaced frame consists of 192-bit time slots (US and Canada) or 256-bit time slots (CCITT) repeated every 125 μ s.

Frame Relay: A bandwidth-on-demand packet-switching technology that is more streamlined than X.25.

Framing: The process of breaking large fields of data into a number of smaller fields, blocks or characters.

Framing Error: A communications effort that occurs when the receiving terminal is unable to determine where a data word begins and ends.

FRED: Fragmentation & Reassemble Engine With DMA

Frequency Hopping System: Carrier frequency shifting in discrete increments in a pattern dictated by a code sequence. The transmitter jumps from frequency-to-frequency within some predetermined set. The order of frequency hops is determined by a code sequence which, in turn, is detected and followed by the receiver.

Frequency Shift Keying: A modulation scheme that shifts between two frequencies to represent a "1" or "0" state of data transmission.

Frequency-Division Multiplexing (FDM): A technique in which an analog communication channel's bandwidth is divided into frequency subchannels to permit several circuits to share the same channel.

Frequency-Shift Keying (FSK): A type of frequency modulation used by low-speed modems.

Front-End Processor: An auxiliary computer system that performs communications functions and frees the host computer to process data.

Front end or Wafer Fabrication: Also known as wafer fab. That part of the IC manufacturing process where integrated circuits are formed on the surface of silicon wafers in a series of steps performed in a clean room environment.

FSK: Frequency Shift Keying

FTT: Fractal Transform Technology

Full-Duplex (FDX): Communications that takes place in both directions at the same time.

Furnace: A long glass (quartz) tube which can be heated to high temperatures. Furnaces are used for giving wafers heat treatments, oxidizing them, or reacting gas in the vicinity of the wafers to result in the deposition of thin films on the wafers (CVD). Furnaces used to be horizontal (long direction of the tube parallel to the floor but current generation ones built for eight inch wafers are mostly vertical (tubes standing upright).

-G-

G.711: CCITT Spec For u-law, A-law Companding, 64 kb/s

G.721: CCITT 32 kb/s ADPCM Coder, 32 kb/s (Now part of G.726)

G.722: CCITT 16 kb/s floating point implementation of wide band ADPCM

G.728: CCITT 8 kb/s Floating Point implementation of Ld-Celp, 5 Nsec delay

G-line: One of the characteristic colors of light given off by mercury arc lamps which are used as light sources in photolithographic steppers. The G-line has a wavelength of 0.436 microns (violet color). G-line steppers were in widespread use down to about the 0.65 micron generation of semiconductor technologies, and are still used for noncritical layers (with larger dimensions) of 0.5 micron chips.

GaAs: Gallium Arsenide

Gain: The amount by which a signal strength is increased when it passes through an amplifier or a repeater. Gain is usually measured in decibels, but it can also be expressed as the ratio of output power to input power.

Gap Fill: Getting deposited films to go down between tightly spaced lines without the creation of voids.

Gateway: A device that connects two or more networks of different types together and functions at OSI layers 1 through 3.

GATT: General Agreement On Tariffs And Trade

GCI: see General Communication Interface.

General Communication Interface (GCI): An ISDN interchip standard interface for both basic rate and primary rate equipment.

General Purpose Programmable DSP ICs: General-purpose DSP ICs are specialized microprocessors that have been optimized for processing real-world signals after they have been converted from analog to digital form. They can be programmed by the user, much as a conventional microprocessor can be programmed by a software programmer.

GeTbSb: Germanium-Terbium-Antimony (Solid State Laser 830nm)

GFSK: Gaussian Frequency-Shift-Keying

GIGO: Garbage In Garbage Out

Glitch: A spike caused by the skew (difference in turn-on/turn-off time) of switches or logic. Glitches are a troublesome source of error in high-speed D/A converters and they are most prevalent at the mid-scale switching location, when all digital input bits are switching. Glitch energy is specified in picovolt-seconds which describes the area under the voltage-time curve at its worst case occurrence.

GMR: Gigantic Magneto Resistive or Great Magneto-Resistance (Magnetic Storage Term)

GMSK: Gaussian Minimum Shift Keying

GPS: Global Positioning Satellite or Global Positioning System

GPS-R: Global Positioning System-Receiver

GQFP: Guard Ring Quad Flat Pack. (Same as QFP with molded carrier ring.)

GRI: Group Repetition Interval

Group Delay: Distortion resulting from non-uniform speed of transmission of the various frequency components of a signal through a transmission medium. Specifically, the propagation delay of a lower frequency is different from that of a higher frequency. This creates a time-related "delay distortion" error.

GSM: Global System for Mobile Communications (also known as Groupe Speciale Mobile)

GSM-FR: GSM Full Rate (70 Coefficients, 13 kb/s)

GSM-HR: GSM Half Rate (70 Coefficients, 6.5 kb/s)

GTL: Gunning Transceiver Logic (Point To Point PC Bus: Processor To Memory)

GUI: Graphical User Interface

-H-

H.261: Video Compression/Decompression Standard

Half-Duplex (HDX): Communications that can take place in either direction, but in only one direction at a time.

Half-rate: A variant on GSM speech coding; doubles capacity (from 8 to 16 users per period) by more efficient speech compression.

Hamming Code: A forward error correction (FEC) scheme named for its inventor. It can correct single-bit errors without the need for retransmission.

Handshaking: A set of signals that coordinate the transfer of data from one device to another.

Harmonic: A frequency that is a multiple of the fundamental.

Harmonic Distortion: A type of communications line interference that is caused by erroneous frequencies that are generated by non-linearities in the system.

HART: Highway Addressable Remote Transducer

HBt: Heterostructure Bipolar Transistor

HCPLD: High Complexity Programmable Logic Device

HD-MAC: European HDTV

HDcD: High Density Compact Disk, Replacement for VHS tape, competes with DVD

HDD: Hard Disk Drive

HDLC: High Level Data Link Control

HDP: High Density Plasma. Plasma with a high concentration of reactive elements in it. High density plasmas are used in advanced plasma etchers and CVD machines.

HDPCVD: High Density Plasma CVD. A chemical vapor deposition technique in which a concentrated plasma is created. This suppresses the bulging at outside corners that standard

CVD films tend to show. HDPCVD is thus a good solution to the problem of getting insulating films to fill in between narrowly spaced metal lines (the gap fill problem). Gap fill is becoming more and more of an issue as semiconductor manufacturers scale down circuit dimensions.

HDSL: High Speed Digital Subscriber Line Modem (or High Density Subscriber Line)

HDT: Host Digital Terminal (HFC Term) or Network Interface Unit (Telephone Fiber Term)

HDTV: High Definition Television

HDX: Half Duplex

Heterodyne: A process by which two signals are mixed for the purpose of cross-frequency translation.

Heterogeneous: Made up of different systems, vendor's products, or architectures.

HFC: Hybrid Fiber Coax. An emerging technology for delivering high-bandwidth video and data to the home. It is based on using fiber optic cable from the switching office to the neighborhood, and coaxial cable from a point within the neighborhood to the home.

Hi PPI: High Performance Parallel Interface

Hierarchical Network: A network topology organized in the form of a pyramid with one terminal at the top and increasing numbers of terminals at each lower level. Also called a Tree Network.

High Bit-Rate Digital Subscriber Line (HDSL): A technology to transport T1 data (1.544 Mb/s) over 12,000 feet of 24-gauge wire or 9,000 feet of 26-gauge wire without the need for repeaters. HDSL requires two pairs of wires. Each of the pairs carries full duplex data at half the total speed using 2BIQ modulation.

High Density Plasma Etcher: An advanced etcher which uses a high density plasma. This results in a better capability

ty for etching small geometries with straight vertical walls (especially difficult for small deep holes) and good selectivity (etching only the layer to be patterned and not attacking the layer beneath).

High k dielectric: An insulator which will not conduct electricity but which when sandwiched between metal plates will easily allow these plates to talk to each other via electric fields (this is called a capacitor structure). These can be used as memories, and one structure that is being considered for very high density DRAMs (dynamic random access memories) is a layer of barium strontium titanate (BST - a high k dielectric) between platinum electrodes. While high k dielectrics are good for capacitors, the opposite is true of the insulators used to separate metal lines, for which low k dielectrics are desirable (see low k dielectric).

High-Level Data Link Control (HDLC): A bit-oriented protocol published by the International Standards Organization in 1977. HDLC was derived from SDLC.

High-speed amplifiers: Generally, amplifiers with speeds of 10 MHz or higher.

Hit: Efforts on a communications link caused by impulse noise.

HCMOS: Half Micron Complementary Metal Oxide Semiconductor

Host Bridge: see North Bridge.

Hot Wall Reactor: A machine (usually a CVD machine) in which the wafers are made hot because the walls of the reactor are hot. A cold wall reactor is a reactor in which the wafers are heated by some other means and so the walls of the reactor do not get as hot as the wafers.

House Cable: Conductors inside a building used to connect communication equipment to outside lines.

HRTF: Head Related Transfer Function

HSDS: High Speed FM Subcarrier Data System (Allows data

to be broadcast over AM/FM radio stations)

HSOP: Power Small Outline Package

HSTL: High Speed Transceiver Logic (Fast I/O Scheme, High Speed I/O)

HTS: High Temperature Superconductor

Hub: A central node in a star network to which all other nodes are connected by means of point-to-point communications links.

Huffman Encoding: A data compression scheme that uses fewer bits to represent frequently occurring characters. Huffman encoding works well with text.

Hybrid: A small electronic module containing IC chips and passive elements. It provides a compact way of achieving a level of functionality that cannot be achieved with a single monolithic IC.

-I-

I&Q: In-Phase and Quadrature - A modulation technique whereby signal information is derived from a carrier frequency at its 0° and 90° phase angles.

I(2)C: Integrated Interface Channel

I(2)S: Inter-Integrated Circuit Sound Bus (Philips standard)

I-line: One of the characteristic colors of light given off by mercury arc lamps which are used as light sources in photolithographic steppers. The I-line has a wavelength of 0.365 microns (ultra violet range). I-line steppers are good for handling the critical layers in 0.5 micron semiconductor technologies, and can be made to work with 0.35 micron technologies. They cannot, however, be used for the critical layers in 0.25 micron technologies, though semiconductor manufacturers are likely to continue to want to use I-line machines for the noncritical layers (with larger dimensions). Excimer laser steppers are the next generation of steppers

following the I-line steppers. Lower resolution G-line steppers preceded I-line steppers historically.

I/O (Analog): Input/Output. Usually used within ADI to refer to the ability of an IC or a piece of equipment to provide analog or real-world inputs and/or outputs.

IAV: Independent Algorithm Vendor

IC: Integrated Circuit. A semiconductor device containing anywhere from hundreds to millions of circuit elements on a single chip. It is usually made of silicon.

IC Package: The package around an IC chip that makes it possible to incorporate the IC into a piece of equipment. There are a great many types of IC packages, which can have as few as 2 leads or more than 1,000.

ICE: In Circuit Emulator

ICSPAT: International Conference on Signal Processing, Applications and Technology

ICT: In Circuit Test

IDCT: Inverse Discrete Cosine Transform

IDE: Integrated Drive Electronic (hard disk drive term)

IDE/ATAPI: IDE Attachment Packet Interface

IEC: International Electrotechnical Commission

IEEE: see Institute of Electrical and Electronics Engineers.

IETF: Internet Engineering Task Force

IFB: Interruptible Feed Back

IF: Intermediate Frequency. A term used in communications to describe frequencies inside a device or piece of equipment that are lower than the frequencies transmitted or received through an antenna, but higher than those contained in the information being transmitted or received.

IFC: International Fieldbus Consortium

IGBI: Inverse Gate Bipolar Technology

IGBT: Isolated Gate Bipolar Transistor

IIR: Infinite Impulse Response or Infinite Impulse Response Filter

IMD: Intermodulation Distortion

IMD: Inter Metal Dielectric

iMEMS®: From Analog Devices. Integrated Micro Electro Mechanical Systems. These systems are typically the size of your fingernail, and with some devices, less than the diameter of a single strand of human hair. They are used for sensing and actuating real world parameters such as pressure, acceleration, position, rotation, and a host of other physical variables.

Impulse Noise: A type of communications line interference characterized by high amplitude and short duration.

IMS: Intelligent Manufacturing Systems

Inband Signaling: A signaling scheme that uses the same path for both data and signaling information. Contrast with Common Channel Signaling.

Information Superhighway: see National Information Infrastructure.

INI file: Initialization file used to “set” switches in a driver.

INL: see Integral Nonlinearity.

Institute of Electrical and Electronic Engineers (IEEE):

A membership organization of engineers that, among other activities, produces data communications standards.

Insulator: A material which will not allow an electric current to flow through it. In semiconductor chips, commonly used insulators are silicon dioxide (glass) and silicon nitride (silicon + nitrogen). These materials are often referred to as dielectrics.

Integral Nonlinearity: This term describes the absolute accuracy of a converter. It is the maximum deviation, at any point in the transfer function, of the converter's output from its ideal value.

Integrated Circuits: A complete electronic circuit with transistors and wires connecting these transistors (metal interconnect) on a semiconductor chip.

Integrated Services Digital Network (ISDN): A telephone service that brings a digital local loop to the telephone subscriber's premises and integrates all forms of information (voice, computer data, facsimile, etc.) onto a single communications network.

Interbay Automation: Automated transport of wafers throughout the entire fab, between the machine bays. One way of doing this is with an overhead monorail system.

Interconnect: Wires patterned in integrated circuits to connect different devices together.

Interface: A common boundary between two or more systems, integrated circuits, or pieces of equipment that ensures a proper connection between them.

Interface Circuits: ICs, within the standard linear IC family, that are used to provide the signals that interface PCs with peripheral devices such as modems, printers and scanners.

International Standards Organization (ISO): The standards organization that developed the Open Systems Interconnect (OSI) Model and other international communications standards.

International Telecommunication Union (ITU): A telecommunications agency established by the United Nations to provide standardized communication procedures and practices including frequency allocation and worldwide radio regulation. The CCITT is part of the ITU.

Internet: A worldwide network connecting millions of computers that is used for electronic mail, file transfers, World

Wide Web services, "chat" services and general data communications.

Internetworking: The technique of connecting individual LANs to form a larger network.

Inter Office Trunk: A telephone circuit that connects two telephone company offices.

Intrabay Automation: Automated transport of wafers within a bay of machines. There are a number of products that are used for this, as machine interfaces are not yet standardized. Mobile robots that run on rails, or are free standing, can be used. Another option is to extend a branch off a central interbay overhead monorail down into the machine bays.

IOA: I/O Address

IOD: I/O Data

Iomation: An ADI product line of assembled-product devices that provide analog and digital input and output capability for industrial automation applications.

Ion Implantation: The process by which dopants are introduced in exact quantities into silicon. A stream of charged particles (called ions) of phosphorus, arsenic, or boron is created and then directed at a silicon wafer at a precisely controlled velocity (energy). In this way, both the concentration and depth of the dopant can be controlled.

IOP: I/O Processor

IP2: Second Order Intercept

IP3: Third Order Intercept

IPC: Industry For Interconnecting And Packaging Circuits

IPX: Internet Packet Exchange (Data Rates > 1.5 Mbps)

IRE: Institute For Radio Engineers

IRE Unit: 7.14 mv Pp (Video)

IS-41: USA roaming protocol used by all US cellular services

IS-54: Interim Standard 54, for analog and digital cellular radio for all of North America, 3 time slots

IS-95 CDMA: 1.25 MHz Spread Spectrum Air Interface for the PCs spectrum

ISA: Industry Standard Architecture (PC-AT Bus) or Instrument Society Of America

ISDN: Integrated Services Digital Network (64 kb/s data rate, single channel)

ISHM: International Society For Hybrid Microelectronics

ISI: Intersymbol Interference

ISM: Industrial Scientific & Medical (unlicensed frequency bands 915 MHz, 2.4 & 5.725 GHz)

ISO: International Standards Organization

ISP: Internet Service Provider

ITU: International Telecommunications Union Standards Section (Replaces CCITT).

-J-

JAN: Joint Army Navy Electronic Device Committee

JCT: Japanese Cordless Telephone

JDC: Japan Digital Cellular, 900 to 1500 MHz

JEDEC: Joint Electronic Device Committee

JEDI: Joint Environment For Digital Imaging

JIT: Just In Time. An enterprise-wide operating philosophy with the basic objective of eliminating waste. When successfully employed, it results in keeping production inventories at the lowest possible level.

Jitter: A type of communications line distortion caused by a signal's random variation from its reference timing position. Also, unwanted variations in the frequency or phase of a digital or analog signal.

JPEG: Joint Photographic Experts Group

JTAG: Joint Test Action Group

JTC: Joint Technical Committee

-K-

KBE: Knowledge-Based Engineering

KGD: Known Good Die

-L-

LAN: see Local Area Network.

LAP: Link Access Protocol

LAPB & LAPD: see Link Access Protocol Balanced & D Channel.

LAPM: see Link Access Procedure for Modems.

Laser Repair: The cutting of fuses made of polysilicon or metal in an integrated circuit, by using a laser. Memory chips are often designed with redundancy - additional memory elements, called redundant elements. If the chip is nearly, but not quite, perfect because a few of its memory elements do not work, it can be repaired by disconnecting the bad memory elements and connecting the good redundant ones. Both the disconnection and connection are done by cutting the right fuses.

LC2MOS IC Process: Linear-Compatible CMOS. A semiconductor process developed by ADI that allows linear circuitry to be included on the same chip with digital CMOS circuitry. Well suited for use in A/D and D/A converter ICs.

LCC: Leadless Chip Carrier

LCD: Liquid Crystal Display

LCN: Local Control Network

LCPGA: Low Cost Pin Grid Array

LD-CELP: Low Delay, Code Excited Linear Prediction

LDO: Low Drop Out (Regulator)

LDR: Light Dependent Resistor

Lead: A name for the metal prongs which stick out of a chip package, allowing electrical connection between the chip inside the package and the outside world.

Lead Frame: A spider-like frame of wires which the chip will be connected to. The lead frame is bent to form the metal pins that run out of the semiconductor package. This allows the packaged chip to be plugged into its electrical socket so that it can function.

Leased Line: A semi-permanent leased telephone circuit that connects two or more points and is continuously available to the subscriber.

LED: Light Emitting Diode

LGA: Land Grid Array

Line Protocol: A control program used to perform data communication functions over network lines which consists of handshaking and line-control functions that move the data between the transmit and receive terminals.

Line Termination (LT): An ISDN interface used between the local loop and the telephone company central office switch.

Linear ICs: ICs that contain only circuitry used to process analog information (e.g., amplifiers). Sometimes also used to refer to devices that also include some digital circuitry, such as A/D and D/A converters, but these types of devices are more accurately described as mixed-signal ICs.

Link Access Procedure for Modems (LAPM): An effort correction scheme.

Link Access Protocol Balanced & D Channel (LAPB & LAPD): Bit-oriented data link protocol standards published by the CCITT that specify the functions of the data link level

of CCITT Recommendation X.25. They are compatible subsets of HDLC. See High-Level Data Link Control.

Link Port vs. Link Buffer: The link ports receive and transmit data on their LxDAT 3-0 data pins; the six independent link buffers may be connected to any of the six link ports.

LMS: Least Mean Square

LNA: Low Noise Amplifier

Local Area Network (LAN): A communications system that connects computers and peripheral devices that are located within a single office, a single building or in adjacent buildings.

Local Central Office: see Central Office.

Local Loop: A telephone circuit that connects a subscriber's station equipment to the switching equipment in the telephone company local office. Also referred to as a subscriber loop.

Local Office Switch: A telephone switch that serves all subscribers connected to a single telephone exchange.

Localization: Files for different countries, including languages and formats.

Localization: The ability to position sound in 3D space.

Logic Chip: A chip that does computations, makes decisions, or makes things happen. For example, the microprocessor in a computer does mathematical computations, amongst other things. The chips in the bank's ATM machines think about your punched-in code number and your bank balance, then decide whether to give you money. Chips can be loosely defined as either logic chips or memory chips. Logic chips usually require more levels of metal wiring (interconnect) on the chip than memory chips, and so logic chip manufacturers require proportionately more metal deposition machines (PVD), planarization machines (CMP), and metal etch machines than memory chip manufacturers.

Loopback: Directing signals back toward the transmitting terminal at some point along the communications path. Used as a method of troubleshooting.

LORAN: Long Range Navigation

LOS: Line of Sight

Low k dielectric: A type of insulator which helps isolate metal connections, preventing these from interfering with each other. Metals which are close together can affect each other's signals through the electric fields which run between them. The ease with which the metal lines couple with each other in this way is affected by the properties of the insulator separating them. The physical parameter which has direct bearing on this is the dielectric constant or k. Low k dielectrics are better than high k dielectrics at suppressing the coupling. Adding fluorine to standard CVD deposited oxide helps, but it is thought that to go further than this in reducing k it might be necessary to go to a completely different material than oxide. While low k dielectrics are desirable for isolating metal lines in integrated circuits, device engineers seek the opposite (i.e., high k dielectrics) for memory storage elements called capacitors.

LPC: Linear Predictive Coding

LPC Bus: Low Pin Count

LTP: Long Term Prediction

LTPD: Lot Tolerance Percent Defective

LUT: Look Up Table

LV TTL: Low Voltage TTL

LVA: Last Voltage Amplifier (Audio Term)

LVDS: Low Voltage Differential Signaling

-M-

MAC: Medium Access Control

MADC: Mobile Audio Daughter Card (from Intel). Similar to AMR but directed at portable platforms.

Magnitude Bit: The second bit in a dibit (group of two bits) in 2 binary, 1 quaternary modulation. The magnitude bit determines the voltage level of the transmitted signal. The other bit is called the sign bit and determines if the voltage is positive or negative.

MAN: Metro Area Network

Manchester Encoding: A coding scheme used with several LANS. Manchester encoding has a logic transition in the center of each bit. A positive transition indicates a logic 1, and a negative transition indicates a logic 0.

MAP: Manufacturing Automation Protocol, Token Passing.

Mark: Communications terminology for a binary 1 in a data communication.

MAS: Multiple Address Services

Mask: Sometimes called photomask or reticle.

Masking Layer: A patterned layer associated with a semiconductor integrated circuit. A typical circuit will require between 12 and 25 masking layers for full definition.

MAU: see Media Access Unit and Multi-Station Access Unit.

MBE: Molecular Beam Epitaxy

MC: Modem Codec - reference to AC'97

MCH: Memory Controller Hub

MCM: Multi Chip Module. A device containing several IC chips arranged in a high density configuration which can be assembled in an automated fashion.

MCP: MultiChip Products.

MCR: Molded Carrier Ring

MCU: Microcontroller Unit

MD: Mini Disc

MDS: Minimum Detectable Signal

MDSL: Medium Bit Rate Digital Subscriber Lines

Media Access Unit: A device used to connect a terminal to a 10BASE-5 Ethernet LAN.

Medium: The path information travels from the transmitter to the receiver in a communications system. (Medium is a singular noun. The plural is media.)

MEFB: Metal Electrode Face Bonded. A Leadless Cylindrical, 2 Terminal SMP

Memory Chip: A chip which retains information for logic chips to use. For example, in a computer, the memory chips will store the word processing program while it is being used, and the letters of the word processing documents that are being worked on. DRAM is the type of memory used most in computers, and is by far the most important type of memory from a total worldwide revenue standpoint. Memory chips tend to have denser transistor layouts and slightly more complicated transistor structures than logic chips. These result in a need for more CVD layers. Memory chip manufacturing thus requires slightly more CVD equipment than logic chip manufacturing.

Merchant Market Supplier: A company (such as Analog Devices) that manufactures and sells its components to OEMS, who incorporate them in their products (as opposed to a captive supplier, which manufactures components only for its own company's use).

Mercury Arc Lamp: The light source that was more or less universally used in photolithographic steppers, up to now. A mercury lamp gives off light that contains a number of bright, well-defined colors, notably the I-line and the G-line, which have been widely used in steppers. However, mercury lamps do not have any bright lines suitable for 0.25 micron

geometries or below. A mercury lamp can be pushed to handle a 0.25 micron technology with difficulty, but we expect that the critical layers of the 0.25 micron and smaller generation technologies will be the province of steppers based on excimer lasers.

MESFET: Metal Semiconductor Field Effect Transistor

Mesh Network: A network topology that features numerous communications links among the terminals.

Message: An information package, typically in a specific digital code, that is transmitted over a communications system.

MFLOPS: Million Floating Point Instructions Per Second

MFM: Manchester Frequency Modulation or Modified Frequency Modulation

MFP: Mini Flat Pack

MFSK: Multi-Level Frequency Shift Keying

MGC: Manual Gain Control

MHEG: Multimedia & Hypermedia Information Code Expert Group

Microloading: A potential problem for etch processes. Areas of the circuit where the pattern is dense may etch at a different rate, or in a different way, from places where the pattern is more open. This is partly the result of localized depletion of the reactant species in regions where a lot of material must be removed. Another factor is reactant transport - it is difficult for reactants to find their way down through narrow corridors of resist if the resist features are close together.

Micron: Also known as a micro-meter. A unit of length equal to one-millionth of a meter or one-thousandth of a millimeter. Used to define the smallest feature size (i.e., minimum line width) on an IC, which indicates how much circuitry can be put on a chip of a given size. Most modem ICs have line widths of 0.35 to 5 microns. A typical human hair has a diameter of about 20 microns.

Micron Network Protocol (MNP): A system of error checking and data compression protocols that has become a de facto standard for modem communications.

Microprocessor (μ P): The digital VLSI IC that is at the heart of a personal computer.

MIDI: Musical Instrument Digital Interface

Midspan Meet: The ability to connect different vendors on a communications network and have them function properly.

MIMD: Multiple Instruction, Multiple Data

MIPS: Million Instructions Per Second

Mixed-Signal IC: An IC such as a codec or an A/D or D/A converter that has both analog and digital circuitry on the same chip.

Mixer: Circuit block used to translate signals from one frequency to another.

MLC: Multi Layer Ceramics

MLSE: Maximum Likelihood Sequence Estimation

MLT-3: Multilevel Threshold (-1 V, 0 V, $+1$ V)

MMI: Man/Machine Interface.

MMIC: Microwave Monolithic Integrated Circuit

MMS: Manufacturing Message Specification

MMSI: Multimode Steroscopic Imaging

MNP: see Micron Network Protocol.

Modem: Modulator/demodulator. A DCE used to modulate digital data onto an analog carrier so they can be sent over an analog communications medium, such as a telephone link, and to demodulate the data at the receiving terminal.

Modulation: The process by which some characteristic of a higher frequency wave is varied in accordance with the amplitude of a lower frequency wave.

Monoceiver®: From Analog Devices. A monolithic IC including a complete receiver or transceiver for communications applications.

Monolithic IC: An IC that consists of a single chip inside a package, as opposed to a hybrid, which can contain many chips in one package.

MOV: Metal Oxide Varistor

MPC: Multimedia Personal Computer

MPEG: Moving Picture Experts Group

MPP: Massively Parallel Processing

MPSK: Minimum Phase Shift Keying

MQFP: Metric Quad Flat Pack. Official JEDEC name for plastic 4 sided gull wing.

MQPSK: Modified Quadri-Phase-Shift-Keying

MR: Magneto Resitive or Magneto-Resistance

MRI: Magnetic Resonance Imaging

MSK: Minimum Shift Keying

MSO: Multiple System Operator

MSP: Mixed Signal Processor

MSS: Mobile Satellite Services

MTBF: Mean Time Between Failures

MTSO: Metropolitan Switching Office

Multi-Drop Network: see Bus Network.

Multi-Media Communications: A communication that is made up of a combination of text, graphics, video and audio.

Multipath Propagation: A transmission path anomaly that acts as a time-varying source of signal non-linearity. Multipath can distort or reduce a received signal to the point of unreliable reception. In television, multipath is manifested as image "ghosting."

star network, although electrically it is still a ring.

Multiplexing (MUX): A process of combining several signals so that they can be sent over a single communications link.

MUX: see Multiplexing.

MVIP: Multi-Vendor Integration Protocol

MWAVE: IBM And TI Version Of Signal Computing

-N-

N-AMPS: Narrow Band Amplifier

N-type Silicon: Silicon which has been doped with phosphorus or arsenic. This makes the electrical carriers which make up the electric current negatively charged electrons.

NAB: National Association Of Broadcasters

NADC: North American Digital Cellular or North American Digital Cordless

NAMPS: Narrow Band Advanced Mobile Phone Service

NAP: Network Attached Peripheral (Fiber Channel Term)

National Information Infrastructure (NII): A Clinton administration initiative to upgrade US broadband communications systems. NII is known in the popular press as the Information Superhighway and the Data Superhighway. Articles in the press often incorrectly imply that the NII is a revolutionary new network instead of an evolution of established technology.

NB: Notebook

NC: Numerical Control

NCSA: National Center For Supercomputing Applications

NDA: Non Disclosure Agreement

NDIS: Network Driver Interface Specification

Glossary of Analog Terminology

NEMA: National Electrical Manufacturer's Association

Network: A set of terminals, the communications links that join them, and the protocols that allow them to function together and communicate with each other.

Network Administrator: A person who is responsible for the efficient operation of one or more LANs.

Network File System (NFS): A protocol that was developed by Sun Microsystems for transparently sharing files across a computer network and has become a de facto standard for UNIX computers. NFS is based upon TCP/IP and Ethernet.

Network Layer: Layer 3 of the OSI Model. It defines how data are switched and routed through the network.

Network Management System: Software for managing the operation of a multi-point network from a central location.

Network Operating System: A software program that provides a network user interface and controls the network's operation to allow users to communicate with each other and share files and peripherals.

Network Termination (NT): An ISDN interface installed at a subscriber's premises that interfaces the customer's premises equipment to the telephone company local loop.

Network Termination 1 (NT1): An interface between a BRI ISDN line and customer premises equipment. NT1 converts the ISDN U line code (2BIQ) to the S interface format.

Network Termination 2 (NT2): An interface between a primary rate ISDN line and customer premises equipment that is functionally similar to a PABX. It accepts many S interfaces on the user side and also provides internal switching capability.

Network Termination Type 1,2 (NT 1,2): An interface that integrates the ISDN NT1 and NT2 functions in a single circuit.

Network Topology: see Topology

Network-to-Network Interface: An ATM interface that connects ATM switches to each other. Also see User-to-Network Interface.

NFS: see Network File System.

NIC: see Network Interface Controller.

NICAM: Near Instantaneous O Analog Multiplex

NII: National Information Infrastructure

NIST: National Institute of Standards & Technology

NIU: Network Interface Unit - Host Digital Terminal

NMOS: n-channel Metal Oxide Semiconductor

NMR: Nuclear Magnetic Resonance

NMT: Nordic Mobile Telephone

NNI: see Network-to-Network Interface.

NNSR: Neural Net Speech Recognizer

Node: A terminal on a data communications network.

Noise: Random and undesired electrical signals that are introduced into communications.

Non-volatile Memory: Semiconductor memory which will not forget its data once the power is switched off. This is in contrast to volatile memory (e.g., DRAMs), which lose their information when there is no power supplied to the chip.

North Bridge: Old style bridge chip for interfacing to memory.

NPO: Negative Positive Zero Change, Capacitor Term, a.k.a., Non Polarized

NRSC: National Radio Systems Committee

NRZ: Non Return To Zero

NRZI: Non Return To Zero, Inverted

NSL: National Storage Laboratory

NSP: Native Signal Processing

Glossary of Analog Terminology

NT: see Network Termination, Network Termination 1, and Network Termination 2.

NT 1, 2: see Network Termination 1, 2.

NT1: see Network Termination 1.

NT2: see Network Termination 2.

NTFF: Double Refresh Rate

NTSC: National Television Standards Committee

NU: see National Information Infrastructure

Nyquist Theorum: This theorem says that if a continuous bandwidth-limited signal contains no frequency components higher than f_C , then the original signal can be recovered without distortion if it is sampled at a rate of at least $2 f_C$. This theorem applies to A/D converter applications as well as data transmission density over limited-bandwidth channels.

-O-

OAM&P: see Operations, Administration, Management and Provisioning.

OC-n: see Optical Carrier at Level n.

OCR: Optical Character Recognition

OCXO: Oven Controlled Crystal Oscillator

ODI: Open Data-Link Interface

OFDM: Orthogonal Frequency Division Modulation

OMPAC: Overmolded Pad Array Carrier

OMPGA: Overmolded Pin Grid Array

ONU: Optical Network Unit

OOK: On-Off Keying

OOP: Object-Oriented Programming

Open Systems Interconnect Model: A communications reference model developed by the International Standards Organization that divides the data communications process into seven layers.

Operational Amplifier: a.k.a., Op Amp. An analog IC whose function is to manipulate analog signals with precision. The term op amp derives from their use many years ago to perform mathematical functions in analog computers. Op amps can be made to perform a wide variety of functions depending on how they're connected, including amplification, filtering, summing and integration.

Operations, Administration, Management and Provisioning (OAM&P): That portion of the SONET and SDH standards that deals with the administration and management of the networks. The OAM&P standards are still under development.

Optical Carrier at Level n (OC-n): A multiple of SONET's basic optical speed of 51.84 Mb/s, where n is the multiple. The electrical equivalents are known as Synchronous Transport Signal at Level n (STS_n).

OQPSK: Offset Quadrature Phase Shift Keying

Originate Modem: The modem that originates communication in a full-duplex communications system.

Orthogonal: Term used to signify that two signals (or signal attributes) are mutually transparent and non-interfering with each other. Frequency and amplitude modulation are orthogonal signal attributes.

OS: Operating System

OSHA: Occupational and Safety Hazard Organization

OSI Model: see Open Systems Interconnect Model.

OSI/DCE: Open System Interconnection/Distributed Computing Environment

-P-

P-type Silicon: Silicon which has been doped with boron. This makes the electrical carriers which make up the electric current positively charged holes.

PAC: Pad Array Carrier. Chip carrier with contact pads on bottom.

Packet: A digital communications technique involving the transmission of short bursts of data in a protocol format that contains addressing, control, and error-checking information, along with the field information, in each transmission burst. Packet can also refer to the fixed-length data unit sent over a communications network. A packet contains data plus the addresses of the sending and receiving terminals, control information, and error checking information. See Packet Switching and Cell.

Packet Assembler and Disassembler (PAD): Equipment providing packet assembly and disassembly facilities.

Packet-Mode Terminal: Data terminal equipment that can format packets and transmit and receive them.

Packet Switching: A method of transmitting units of data (called packets) through a mesh network. There is no physical circuit established between end points; instead, each packet is individually relayed from one switching node to the next, and individual packets may take different routes through the switching network.

PACS (TDMA): Personal Access Communication System

PAD: see Packet Assembler and Disassembler.

PAL: Phase Alternation Line (European TV Standard)

PAM: Pulse Amplitude Modulation

PAMR: Public Access Mobile Radio

PARCOR: Partial Auto-Correlation (Speech Recognition Term)

PARD: Periodic And Random Deviation

Parity: A redundant bit added to each data word in a communication to aid in error detection. All words in the data section of the communication packet have a parity bit added to bring the total count of "1"s to either an odd total (odd parity) or an even one (even parity). If any one bit is corrupted, the count will no longer agree and the error is detected.

Parity Error: The error that occurs in a DTE when the received data has the wrong parity.

PASC: Precision Adaptive Sub-Band Coding

Passive Bus: An ISDN multi-point S interface bus that can support a maximum of eight TAs or TEs. The short passive bus can be up to 200 meters in length, and the extended passive bus has a maximum length of 500 meters.

PBGA: Plastic Ball Grid Array

PBX (also PABX): Private Branch Exchange

PC'98, PC'99: From Microsoft & Intel. Standards covering all aspects of PCs including audio. Relates to end system performance.

PCB: Printed Circuit Board

PCI: Peripheral Controller Interface. Internal bus standard, current solution for audio.

PCI: Peripheral Component Interconnect

PCIA: Personal Communications Industry Association

PCM: Pulse Code Modulation

PCMCIA: Personal Computer Memory Card, International Association Standard

PCN: Personal Communications Network

PCS: Personal Communications Services

PCS/PCN: Personal Communications System/Networks

PDA: Personal Digital Assistant

PDC: Personal Digital Cellular (formerly JDC)

PDIP: Plastic Dual In-Line Package

PDM: Pulse Duration (Density) Modulation

PDR: Physical Dependent Receiver

PDS: see Premises Distribution System.

PECL: Pseudo ECL (0 To +5 V Logic)

PEEL: Programmable Electrically Erasable Logic

PEX: Phigs Extension To X-Windows

PFM: Pulse Frequency Modulation

PGA: Pin Grid Array or Programmable Gain Amplifier

Phase Locked Loop (PLL): An electronic circuit that consists of a phase detector, low-pass filter, and voltage-controlled oscillator so connected that the oscillator frequency (or phase) accurately tracks that of an applied frequency- or phase-modulated signal. The PLL is useful in frequency demodulation and bit-synchronization.

Phase Noise: The amount of phase noise energy contained in a frequency carrier. Specified in dB/Hz, phase noise amplitude is usually characterized and plotted in 1 Hz increments, offset from the carrier.

Phase-Shift Keying (PSK): A digital modulation technique where the phase of a carrier frequency is shifted to represent a digital "1" or "0" state. In "Quadri-phase-shift keying" systems, the phase angle locations of 0, $\pm 90^\circ$, and 180° are used as reference points to represent sixteen possible digital states.

PHIGS: Programmers Hierarchical Interactive Graphics System

Photolithography: The photographic process used to transfer circuit patterns onto a semiconductor wafer. This is done by projecting light through a patterned reticle, onto a silicon

wafer covered with a photosensitive material (photoresist). A reticle is a glass plate with a layer of chrome on one side.

Photoresist: Sometimes referred to as simply resist. This is a photosensitive material which will dissolve in developer if it has been exposed to light. Patterns are transferred to a wafer by covering the wafer with photoresist, exposing a pattern in the photoresist and then using the patterned photoresist as a mask through which to implant dopants or etch the material.

PHP: Personal Handy Phone (Japanese)

PHS: Personal Handy Phone System

Physical Layer: The lowest layer (Layer 1) of the OSI Model that defines the physical medium for data communications.

Physical Vapor Deposition (PVD): Deposition of thin films by physical means as opposed to chemical (like chemical vapor deposition). This is most often used for deposition of metals. The most common form of PVD is sputtering, in which a metal target is exposed to plasma made from a gas like argon which is not chemically reactive. The excited gas atoms hit the target and knock off metal atoms which deposit onto a wafer placed below, building up the desired metal film.

Pi/4 DQPSK: Pi/4 Differential Quadrature Phase Shift Keying

PIC: Personal Intelligent Communicator

PID: Proportional Integrating Differentiating

PIN: P Type, Intrinsic, N Type, Diode

PIND: Particle Impact Noise Detection

Ping Pong Modulation: see Time Compression Multiplexing

Pin Electronics: The electronic circuitry in a production-oriented VLSI IC tester associated with each individual pin on a device being tested.

Planar: Same as Mother Board

Planarization: Flattening the surface of the wafer. Both the devices and the metal wires used in the circuits have height (albeit microscopically small height). Several layers have to be built up, one on top of another, to make a complete circuit. It is difficult to accurately do the lithography and etching needed to create later layers if the surface of the wafer is not flat. Thus, every so often process steps must be added in to flatten the surface of the wafer. This is called planarization, and in modern advanced processes it is often done with chemical mechanical polishing (CMP).

Plasma: A highly excited gas. Plasmas are created by exposing gases at low pressure to an electric or electromagnetic field. In semiconductor processing, plasmas are used for etching and thin film deposition (the excited state of the gas makes it very reactive). In everyday life, plasmas are used to give light - in fluorescent light bulbs, neon lamps and blue insect traps.

Plasma Ashing: A variant of plasma etching, used specifically for removal of photoresist. A plasma of oxygen ions is created and these ions react with the oxygen and carbon which make up photoresist to create water vapor and carbon dioxide. The photoresist is thus burned away or ashed, not so much because of high temperature, like in a fire, but because the oxygen is made particularly reactive when it becomes a charged ion in the plasma.

Plasma Enhanced Chemical Vapor Deposition (PECVD):

Chemical vapor deposition in which a plasma is created from the reactant gases. The ions in the plasma are in an excited state and so will easily react with the silicon wafer, without the need for elevated temperatures as in conventional (thermal) CVD.

Plasma Etching: Also called dry etching. This involves using a plasma to etch a semiconductor layer. The plasma contains highly excited molecules (reactive ions) which easily react chemically. There is also a physical bombardment mechanism in that the ions are accelerated towards the wafer with

an electric field. Plasma etching is usually anisotropic, which means that the etching takes place in only one direction (line of sight). This is a key advantage over wet etching with chemicals.

Platform: The frame of the machine, including robotic handling apparatus, needed to feed wafers from their loading station into the individual process modules in which the processing will occur. Cluster tools are machines in which more than one process chamber is mounted on the platform, so that several wafers can be processed at a time (with identical or different processes).

PLC: Programmable Logic Controller

PLCC: Plastic Leadless Chip Carrier

PLF: Physical Layer Framer

PLL: see Phase Locked Loop.

PLP: Physical Layer Processor

PLS: Programmable Logic Controller

Plug: A metal filling (often tungsten) in a hole etched through a layer of insulator. Plugs connect metal lines to each other or to silicon devices.

Plug-In Modem: A modem built onto a circuit board which plugs into a slot on the motherboard of a terminal or computer.

PM: Phase (Pulse) Modulation

PMA: Program Memory Address

PMD: Physical Media Dependent

PMD: Program Memory Data

PMR: Private Mobile Radio

PMSM: Permanent Magnet Synchronous Motor

PN: Pseudo Noise or Pseudo-Random Noise

PNCG: Pseudo Random Noise Code Generator

PnP: Plug And Play

Point-to-Point Network: A communications network consisting of a single communications link that connects two terminals and is not shared by other terminals.

Polysilicon: Silicon which is deposited on wafers in a form that is crystalline, but is not one continuous crystal like the silicon wafers are. Polysilicon is used as a critical part of a transistor called the transistor gate. It is also sometimes used as a resistor, and as a wire for connecting things together (although it does not conduct electricity as well as the metal wires used in integrated circuits). The term "polysilicon" is a contraction of "polycrystalline silicon."

Polling: A control message sent from a master terminal to a slave terminal as an invitation for the slave to transmit.

PON: Passive Optical Networks

Port: The hardware that permits data to enter or exit a computer, network node, or communications device. Also see Communications Port.

POSIX: Portable Operating System Interface

Power Management ICs: ICs used to regulate voltage or current, or to control the battery charging cycle in portable devices like laptop computers and cellular phones. Analog Devices, for example, offers LDOs, battery chargers, dc/dc converters and charge pumps, which all fall into this category.

PPGA: Plastic Pin Grid Array

PPM: Pulse Position Modulation

PQFP: Plastic Quad Flat Pack

PRA: ISDN primary rate access. See Primary ISDN.

PRBS: Pseudo Random Bit Sequence

Precision Op Amp: Historically, operational amplifiers with

less than 1mV offset.

Premises Distribution System (PDS): AT&T's twisted-pair and fiber-optic wiring scheme, which is also supported by other vendors including Xerox and Hewlett-Packard.

Presentation Layer: Layer 6 of the OSI Model. It performs code conversions and data reformatting, formats information for display on the terminal screen, and performs data compression and decompression.

PRI: see Primary Rate Interface.

Primary ISDN: see Primary Rate Interface.

Primary Rate Access: see Primary Rate Interface.

Primary Rate Interface: A form of the Integrated Services Digital Network (ISDN) designed for business subscribers. It uses the bandwidth of a T1 carrier system in North America and of an E1 carrier system in Europe. Also see 23B+D and 30B+D.

Primary Ring: The data path that normally carries communication on an FDDI network. There is also a secondary ring, which serves as a backup if the primary ring is damaged.

Private Branch Exchange (PBX or PABX): Telephone company jargon for switching equipment located on the subscriber's premises.

Private Data Network: A communication network (most often using packet-switched technology) that is designed specifically for the communication of computer data and used by many subscribers.

PRML: Partial Response Maximum Likelihood

PRN: Pseudo Random Noise

Probe Card: A custom made card with needles (probes) that have been manufactured to line up with the contact pads of a specific chip circuit. The probe card is brought into contact with each die (chip) on a wafer (using a prober) so that

the die can be electrically tested before packaging.

Prober: A machine for aligning contacting pins (probe cards) to the dice (chips) on a wafer, so that these chips can be electrically tested even before they are packaged up and connected to standardized metal leads. This is termed wafer level probing.

PROFIBUS: German Token Ring Bus Standard Developed By Siemens

Program Memory: Region of memory in which 48-bit instruction words and (optionally) 32-bit or 40-bit data words are stored; implies that the PM bus is used for accesses.

Programmable Gain (PGA): An amplifier with an analog- or digitally-controlled gain.

PROM: Programmable Read Only Memory **Protocol:** A system of rules that controls the operation of a communications system and facilitates the orderly transfer of information.

PSCS: Personal Sound Communication System

Pseudo-Noise: Any group of code sequences that exhibit a noise-like characteristic.

Pseudoternary Coding: A form of digital signaling that uses three signal levels to represent binary data. In ISDN, pseudoternary coding represents a binary 1 with no signal level, and a binary 0 with alternately positive and negative pulses.

PSK: see Phase-Shift Keying.

PSRAM: Pseudo-Static Random Access Memory

PSS: Personal Sound System

PSTN: Public Switched Telephone Network

PSU: Package Switch Unit

PTT: Postal telephone and telegraph. A generic term for Euro-

pean telephone companies, which are generally operated by the country's postal service.

Pulse Code Modulation: A method of quantizing audio-range analog signals into a digital form for transmission in digital communications systems, or for processing in DSP. Effectively the same as analog-to-digital conversion.

PWB: Printed Wire Board

PWM: Pulse Width Modulation

-Q-

QAM: see Quadrature Amplitude Modulation.

QFP: Quad Flat Pack

QIC: Quarter Inch Cartridge

QMFSSK: Quadrature Modulation Frequency Shift Keying

QPSK: Quadri-Phase-Shift-Keying

QTCP: Quad Tape Carrier Package

Quadrature Amplitude (QAM): A combination of phase-shift modulation and amplitude modulation, as used in most information dense communication schemes, achieving several bits/Hz.

Quaternary: A coding scheme that uses four different voltage levels to represent information, used over the local loop with basic ISDN.

-R-

R Interface: Connects a terminal adapter (TA) to non-ISDN equipment (TE2), often by means of an RS-232 interface.

R Reference Point: see R interface.

RADAR: Radio Detection And Ranging

RAID: Redundant Arrays of Independent Disks

RAM: Random Access Memory

Rapid Thermal Processing: RTP for short. A method of rapidly heating up a wafer by exposing it to bright lamps. Wafers can be raised from room temperature to up to 1100°C in seconds, and cooled in a similar length of time.

Raw Wafers: The raw material for manufacturing ICs.

RBDS: Radio Broadcast Data System

RBOC: See Regional Bell Operating Company.

Real-World Signal Processing: Sometimes abbreviated RWSP. Processing analog signals to measure real-world phenomena such as temperature, pressure, sound, images, speed and acceleration. Analog Devices' products, for example, process this information while it is still in analog form, convert it from analog to digital form, and then further process it after it is in digital form.

Reduction Stepper: A photolithography machine that reduces the image which is projected onto the wafer. A typical reduction factor is 5x, which makes life easier for the reticle makers since they can make the features on the reticles five times larger than what is needed on the circuit. Reduction optics is more complicated though and so reduction steppers are more expensive than 1x (non-reduction) steppers. However, the most advanced steppers for the leading edge technologies are usually reduction steppers.

Redundancy: Memory chips are often designed with additional memory elements, called redundant elements. If the chip is nearly but not quite perfect because a few of its memory elements do not work, it can be repaired by disconnecting the bad memory elements and connecting the good redundant ones. Both the disconnection and connection are accomplished by cutting fuses made of polysilicon or metal in the circuit by using a laser.

Redundant Data: Data that is not necessary for the information content of a transmission. Redundant data are usually

added to transmitted information to aid in the detection of communications errors.

Regional Bell Operating Company (RBOC): Local telephone operating companies that were split off from AT&T and which provide most local and intrastate telephone service in the US. Also called Bell Operating Companies (BOC).

Renegotiation Protocol: A protocol that enables two modems to negotiate such factors as the communication speed, data compression speed and error correction scheme that they will use to communicate.

Repeater: A device that operates at OSI Model Level 1 and connects two smaller LAN segments to form a larger network.

Resist: A common term for photoresist.

Resist Track: Sometimes called a track. A common name for a photoresist spin coater. See spin coater. The term "track" comes from the early designs in which wafers were transported to and from the spin stations on parallel rails called tracks. These days the more advanced spin coaters use robotic arms for movement of the wafers.

Reticle: Sometimes called a mask or a photomask. This is a glass plate with chrome on one side in which a pattern is etched. The pattern is transferred to the wafer by shining light through the reticle. A typical semiconductor circuit will need between 12 and 25 masking layers.

RF: Radio Frequency or radio frequencies used for wireless communications.

RFI: Radio Frequency Interference

RFID: Radio Frequency Identification

RGB: Red, Green, Blue

RH: Reconfigurable Hardware

RHA: Radiation Hardness Assurance

RHET: Resonant Tunneling Hot Electron Transistor

RIAA: Recording Industry Association Of America

Ring Network: A network topology that connects its terminals in a loop or ring.

Ring-Wrap: see Self-Healing.

RISC: Reduced Instruction Set Computer

Riser card: Small card that fits into a slot or connector on mother board, a.k.a., Daughter Card.

RLL: Run Length Limited

RLS: Recursive Least Square

RNG: Random Number Generator

ROM: Read Only Memory

Router: A device that connects two or more LANs and operates at OSI Model layers one through three. A router is able to select from among multiple paths to route a data packet through the network based on an address sent with the data.

Routing Field: Information that a router adds to a frame to specify the path that the frame should take to travel from the LAN where it originated to the LAN where the destination node is located.

Routing Table: A table of the addresses of the various nodes on the LANs served by a bridge or other internetworking device. The routing table allows frames to be forwarded to the LAN where their destination node is located.

RPD: Registered Protective Devices

RPE: Regular Pulse Excitation

RS-232: A recommended serial standard that is frequently used to interface a DTE and a DCE.

RS-422: A recommended standard published by the EIA to specify electrical signal levels of a serial interface. RS-422 uses balanced circuits and is designed to be used with the RS-449 mechanical specification.

RS-423: A recommended standard published by the EIA to specify electrical signal levels of a serial interface. RS-423 uses unbalanced circuits and is designed to be used with the RS-449 mechanical specification.

RS-449: A recommended standard published by the EIA to specify the functional and mechanical interface between a DTE and a DCE. RS-449 is designed to replace RS-232, but it does not specify the electrical signals, which are often RS-422 or RS-423 levels.

RSFQ: Rapid Single Flux Quantum

RSSI: Receive Signal Strength Indicator or Received Signal Strength Indication

RTA: Rapid Thermal Annealing

RTD: Resistor Thermal Detector

RTOS: Real Time Operating System

Run-Length Encoding: A data compression scheme that replaces repeated characters in a data stream with a shorter code. Run-length encoding works well as a compression technique for many types of non-text data.

Rx: Receiver

RZ: Return to Zero

-S-

S Interface: An ISDN four-wire, 1000 meter basic access interface between various TE, TA or NT equipment, usually within a private network such as a PBX. The point where ISDN terminal equipment can be connected to the network termination equipment. It is defined in CCITT recommendation 1430.

S Reference Point: see S Interface.

SAC: Semiconductor Assembly Council

SAPI: see Service Access Point Identifier.

Glossary of Analog Terminology

SAR: see Segmentation and Reassembly or Successive Approximation Register

SAW: Surface Acoustic Wave

SBC: Single Board Computer

SBD: Smart Battery Data

SBS: Smart Battery Systems

SC Bus: Signal Computing System Architecture Bus

Scanning Electron Microscope (SEM): A microscope that uses an electron beam to image very small features. SEMs have much higher resolutions than optical microscopes. SEMs are used in semiconductor manufacturing for measuring the widths of circuit geometries (critical dimension or CD tools), and have other applications too.

SCC: Serial Communications Control

SCI: Scalable Coherent Interface

SCP: Stacked Chip Package

SCPDM: Suppressed Clock Pulse Duration Modulation

SCSI: Small Computer System Interface

SDC: Synchronous Data Compression

SDH: Sonet/Synchronous Digital Hierarchy

SDIP: Shrink Dual-In-Line Package

SDK: Software Development Kit (released by Intel or Microsoft)

SDLC: see Synchronous Data Link Control.

SDRAM: Synchronous DRAM

SEC: Standard Evaluation Circuit

SECAM: Sequential Code Avec Memoire (Code With Memory)

Secondary Ring: A data path that serves as a backup on an FDDI network in case the primary ring is damaged.

Segmentation and Reassembly (SAR): An ATM technology that involves dividing information into ATM cells for transmission over the network and reassembling cells into the original data packages at the receiver.

SEL: Single Ended Load. Expression for a speaker connected between an amplifier and ground.

Selective Forwarding: The ability of a bridge or other inter-networking device to pass from one LAN to another only those frames that are addressed to a node on the output side of the bridge.

Self-Healing: A feature of an FDDI LAN that permits the nodes on either side of a break in the primary and secondary rings to connect the two rings together to bypass the break. The resulting configuration is sometimes called a ring-wrap.

Semiconductor: A substance with electrical conductivity in the range between that of conductors and insulators. It also has a crystal structure whose atomic bonds allow the conduction of current by either + or - carriers when the proper dopants are added. Also a device made from semiconductor material. Integrated circuits, most of which are made of silicon, are a type of semiconductor, and semiconductors form the basis of virtually all modern electronics equipment.

Sequence Control: A method of numbering blocks of data so that no block will be lost or duplicated, and so that the blocks will be placed in proper sequence at the receiver.

Server: A computer on a network that serves as a central repository for data and programs, and which can be accessed over the network by other computers, called clients.

Service Access Point Identifier (SAPI): A field of a LAPD frame that indicates the logical address of the called terminal.

Session Layer: Layer 5 of the OSI Model. It provides a method for data exchange among different software appli-

cations and provides a way to recover from major data transfer problems.

SEU: Single Event Upset

SFB: Shared Frame Buffer (Video Graphics Term), competes with GUI

SFDR: Spurious-Free Dynamic Range

SHARC: Super Harvard Architecture Computer

Shared-Bandwidth Services: Common carrier packet-switched wide area networks that charge users only for the amount of information actually transmitted over the network.

Shielded Pair: A pair of conductors that are wrapped with metallic foil to isolate the pair from electrical interference.

SHORAN: Short Range Navigation

Short Passive Bus: see Passive Bus.

SHTTP: Secure-Hypertext Transfer Protocol, Security Protocols For The Internet

SIA: Semiconductor Industry Association

SID: Society For Information Display

Sign Bit: The first bit in a dibit (group of two bits) in 2 binary, 1 quaternary (2B1Q) modulation. The sign bit determines if the voltage of the transmitted signal is positive or negative. The second bit is the magnitude bit. It determines whether the voltage is positive or negative.

Signal Conditioning: The processing of analog signals, which oftentimes originate as small signals (e.g., only a few millivolts) from real-world sensors, in advance of other processing, such as A-to-D conversion. Signal conditioning can involve amplification, filtering, isolation and linearization, as well as other operations.

Signal-to-Noise (S/N) Ratio (SNR): The ratio of desired signal level to noise on a communications link, usually expressed in decibels.

Signaling: In a circuit-switched telecommunications network, the exchange of information that is concerned with the establishment, control, and management of a telephone connection.

Signaling System 7 (SS7): A technology in which signaling information related to many information circuits is conveyed over a separate signaling circuit by means of addressed packets. See Common Channel Signaling.

Silicon: Pure silicon is used to make almost all the semiconductor chips currently sold on the market. Silicon is not the only semiconductor which can be used to make integrated circuits, but it does have many properties that make it quite a bit better for this purpose than the other known semiconductors. When silicon is combined with oxygen it becomes silicon dioxide.

Silicon Dioxide: Sometimes just called oxide in the semiconductor industry. Sand on the beach and the glass from which we make bottles is silicon dioxide. Silicon dioxide is an insulator, and is used in semiconductor circuits to isolate different conducting regions. Silicon dioxide can be grown from silicon by exposing it to oxygen at high temperatures, or it can be deposited using chemical vapor deposition.

Silicon Nitride: An insulating material used in semiconductor processing which is a mixture of silicon and nitrogen. It can be used to protect silicon from being oxidized. It is also often used right at the end of the process as a protective capping film on the chip (called a passivation layer). Silicon nitride is usually deposited by chemical vapor deposition (CVD).

SIM: Subscriber Identity Module. A card used in GSM to 'personalize' a handset. An ISO format smartcard, it stores the user's details (number, PIN, etc.).

SIMM: Single In Line Memory Module

Simplex: One-way only communications.

Sin X/X: The output of a D/A converter is a series of quantized levels that represent an analog signal whose amplitude is determined by the sin/X response. At higher output frequencies, a D/A converter application may require a sin X/X compensation filter to normalize its output amplitude.

SINAD: Signal-to-Noise and Distortion

Single-Attach Node: An FDDI terminal that does not connect to the secondary ring of the network. It is connected to the primary ring by means of a concentrator.

SIP: Single Inline Package

SLICs: Standard Linear Integrated Circuits. Analog Devices' standard catalog products, including both linear-only ICs, such as amplifiers, and mixed-signal ICs, such as data converters. These ICs are typically general-purpose, single-function devices that can be used in many different applications, including instrumentation, factory automation and military/aerospace markets, and increasingly in high volume computer and communications applications.

SLAM: Single Layer Alumina Metalized

SLIC: Standard Linear Integrated Circuit. Also, see Subscriber Line Interface Circuit.

Slot: A unit of time in a time-division multiplexed frame during which a subchannel bit or character is carried to the other end of the circuit and extracted by the receiving demultiplexer.

Slurry: A suspension of an abrasive grit in reactive chemicals that is used in chemical mechanical polishing. Different slurries must be used, depending on the metal or oxide layer that is to be polished.

SMBus: Smart Management Bus

SMD: Standard Microcircuit Drawing

SMD: Surface Mount Device

SMDS: Switched Multi-Gigabit Data Service

SMI: Spatially Multiplexed Image

SMIF: A wafer manufacturing concept in which wafers are kept in sealed pods when they are not being processed in machines. One of the original drivers for SMIF was the thought that this would reduce particle contamination.

SMPGA: Surface Mounted Pin Grid Array

SMPTE: Society Of Motion Picture And Television Engineers

SMR: Specialized Mobile Radio

SMSL: Standard Multimedia Hypermedia Supervisory Language

SMT: Surface Mount Technology. A type of IC packaging technology that allows an IC to be soldered to metal traces on the surface of a printed circuit board. Specifically, the IC package does not have leads that go through holes in the board. This simplifies printed circuit board layout and manufacturing, and permits higher component density on a printed circuit board.

SNMP: Simple Network Management Protocol

SNR: Signal to Noise Ratio. An expression of the quality of the sound. Higher is better.

Soft Modem: Modem that utilizes the host processor to interpret protocol and MC 97 codec.

SOG: Spin On Glass

SOI: Silicon On Insulator

SOIC: Small Outline Integrated Circuit

SOJ: SOIC With J Leads

SOL: Small Outline Package

SONET: see Synchronous Optical Network.

SOP: Standard Operating Procedure

SORF: Small Outline Radio Frequency. 8 Lead SOIC With Special Inside Lead Connects.

SOT: Small Outline Transistor

South Bridge: Old style bridge chip for interfacing to PCI, ISA and Super I/O controller.

SP50: Standard Project (Committee #50)

Space: Communications terminology for a binary 0 in a data communication.

SPDIF: Sony/Philips Digital Interface Format (Digital Audio)

SPEC: System Performance Evaluation Committee

Spectrum: A continuous range of frequencies within which signals have some common characteristic.

SPI: Serial Peripheral Interface

SPICE: Simulated Program for Integrated Circuit Evaluation, the most widely used computer simulation language for analog circuit analysis. Program allows user to create math models of linear devices for design purposes prior to building a circuit.

Spin Coater: Also called a resist track or a track. A machine for applying photoresist uniformly to a wafer by spinning the wafer during or after pouring on the photoresist. Spin coaters are also used for developing and drying resist. In addition they can be used for coating wafers with other liquid films.

Spin Tool: Sometimes called a spin-rinse-dryer or SRD. This is a machine for etching or cleaning wafers in wet chemicals. It is constructed like a front loading laundry machine. A cassette holding its wafers is turned round and round as chemicals are dispensed over the wafers. Wafers are rinsed in pure (de-ionized) water, and dried by spinning at high speeds.

SPLIC: Special Purpose Linear Integrated Circuit. A term originated by Analog Devices that refers to an IC with linear or mixed-signal circuitry that performs multiple func-

tions to meet the requirements of a specific high-volume application.

SPORT: Serial Port

SPP: Sequenced Packet Protocol

Spray Tool: This is a machine for etching or cleaning wafers in wet chemicals. It works like a dishwasher in that chemicals are sprayed at the wafers. The cassettes holding the wafers are rotated while this is happening.

Spread Spectrum: This communications technique has been used in secure military systems for a number of years and is now becoming popular in commercial systems. This format involves transmitting information which has been multiplied by a pseudo-random noise (PN) sequence which essentially "spreads" it over a relatively wide frequency bandwidth. The receiver detects and uses the same PN sequence to "despread" the frequency bandwidth and decode the transmitted information. This communications technique allows greater signal density within a given transmission bandwidth and provides a high degree of signal encryption and security in the process.

Spurious-Free Dynamic Range (SFDR): This refers to the range between the highest level of the fundamental range frequency and the highest level of any spurious, or harmonically-related, signal. SFDR is expressed in dB.

Sputtering: A form of physical vapor deposition (PVD) often used for deposition of metal films. Sputtering involves knocking metal atoms off a disc of pure metal with charged, energetic, chemically inactive atoms called ions (from a plasma). The metal atoms will re-deposit onto the wafer to build up the desired metal film.

SPV: Surface Photo Voltage

SQFP: Shrink QFP. Now Called FQFP

SQPSK: Staggered Quadriphase Shift Keying

SQUID: Superconducting Quantum Interface

SRC: Sample Rate Convener

SRM: Standard Reference Material

SS: Spread Spectrum

SS7: see Signaling System 7.

SSA: Serial Storage Architecture

SSB: Single Side Band

SSHE: Spread Spectrum Headend

SSL: Secure Sockets Layer

SSOP: Shrink-Small Outline Package (T.I.)

Stand-Alone Modem: A modem that connects to a terminal by means of an RS-232 or other serial interface.

Standard: A specification for data communication that is widely accepted and implemented by communications vendors. Standards may be formal (published by a recognized standards organization) or de facto (accepted without formal publication).

Star Network: A network topology with a central hub and a number of remote terminals. Each remote is connected to the hub by a point-to-point network.

StarLAN: See 1BASE-5 Ethernet.

Start Bit: A space placed at the beginning of each data word in asynchronous.

Static Router: A router wherein the routing table must be reprogrammed by the network manager every time there is a change made to the internetwork.

Station: A terminal on an Ethernet LAN.

Station Equipment: All parts of the telephone network that are located on the subscriber's premises including the telset, switchboards, terminals, and wiring.

Step and Repeat: What a photolithographic stepper does.

Stepper: A photolithography machine used to expose a pattern on a wafer by shining light through a reticle (a glass plate containing a pattern etched in chrome). Since it cannot accurately expose the entire wafer at once, a stepper exposes an area of a smaller size and keeps repeating this until the whole wafer is covered. This process is called step and repeat. An eight inch wafer might need about 80 fields for full exposure.

STL: Studio-Transmitter Link

Stockers: Automated storage units for wafers when they are not being processed.

Stop Bit: A mark placed at the end of each data word in asynchronous communications.

Store and Forward: A data communication technique that accepts packets, stores them until they are validated and complete. And then forwards them to the next node on the packet path.

STP: Shielded Twisted Pair

STS-N: see Synchronous Transport Signal at Level n.

Sub-micron Process: A semiconductor fabrication process whose minimum feature size (i.e., minimum line width) is less than one micron (a micron is one-thousandth of a millimeter).

Subscriber: A customer of a telephone company or other communications carrier.

Subscriber Line: Data transmission capacity over conventional twisted pair telephone lines. ADSL is a contender for a major piece of the "information highway" pie and it promises to deliver telephone, TV, and data services to your home over the existing telephone line.

Subscriber Line Interface Circuit (SLIC): The telephone company electrical interface between an analog copper local loop and the central office switch.

Subscriber Loop: see Local Loop.

SUNI: Saturn User Network Interface

Supervisory Information: Signaling information used to connect, maintain, and disconnect a telephone circuit.

Supplementary Services: Additional services that a telephone company can make available to its subscribers in addition to basic telephone service. Examples include caller identification, call waiting, call rejection, and call forwarding.

Surface Micro-machining: A semiconductor processing technology that involves creating movable silicon structures on the surface of an IC chip, compatible with IC circuitry included on the same chip. ADI has been a pioneer in developing this technology, and has used it to develop an accelerometer that is used as a crash sensor in automobile airbag systems.

SVD: Simultaneous Voice & Data

Switched-56 Service: A circuit-switched 56-kb/s digital telephone service that is widely available in North America and that is regarded as an interim technology until ISDN is in place. Switched 56 uses a 64-kb/s circuit of which 8 kb/s are reserved for in-channel signaling.

Switched Multi-Megabit Data Service (SMDS): A high-speed packet-switched metropolitan area data service that is offered by some telecommunications carriers. The largest use of SMDS is for the rapid communication of medical images.

Switching: The routing of information through a communications network.

Switching Equipment: Equipment located in the telephone company offices that makes the interconnection between the station equipment of two or more subscribers.

SWR: Standing Wave Ratio

Synchronous Communications: A form of communications in which the sending and receiving terminals operate from the same clock signal.

Synchronous Data Link Control (SDLC): A bit-oriented protocol published by IBM in 1974.

Synchronous Digital Hierarchy (SDH): The European and international version of North America's SONET standard for transporting digital information over optical fibers.

Synchronous Optical Network (SONET): A data transmission standard for sending high-speed data over a fiber-optic network.

Synchronous Transport Signal at Level n: At the electrical circuit level, a multiple of SONET's basic speed of 51.48 Mb/s. The equivalent optic speeds are known as Optical Carrier at Level n (OC-n).

System-Level IC: A digital or mixed-signal VLSI IC that incorporates multiple functions on a single chip. The functions on the chip work together to provide most or all of a system-level function in the equipment in which they are used. These devices are usually application specific.

-T-

T Interface: Electrically identical to the ISDN S interface but with a different protocol. The T interface links NT2s to the NT1.

T Reference Point: see T Interface.

T-DAB: Terrestrial-Digital Audio Broadcasting

T1 (Carrier System): A digital communications link that operates at 1.544 Mb/s in North America and Japan. The European version is called E1 and operates at 2.048 Mb/s.

T1 Committee of the Exchange Carriers Standards Association (TIX1 Subcommittee): The American National

Standard Institute's subcommittee that is developing the SONET standards.

T1X1 Subcommittee: see T1 Committee of the Exchange Carriers Standards Association.

T2 Carrier System: A North American digital communications link that is formed by multiplexing three T1 systems and operates at 6.312Mb/s. The European version is E2.

T3 Carrier System: A North American digital communications link that is formed by multiplexing seven T2 systems and operates at 47.736 Mb/s. The European version is E3.

TA: see Terminal Adapter.

TAB: Tape Automated Bonding

TACS: Total Access Communication System

TAG: Technical Ad-Hoc Groups, Air Interface Technical Group

TAG5: The formal group responsible for the PCS-1900 standard.

TAP: Test Access Port (Best Term)

Tape Out: To make printed circuit board art works using actual black tape on mylar and cut with a knife. Today these are CAD-generated.

TAPI: Telephony Services Application Programming Interface

TAR: Test Accuracy Ratio.

TBGA: Tape Ball Grid Array

TCI: Technology Conformance Inspection.

TCM: Time & Cost To Market. See also Time Compression Multiplexing.

TCP: Tape Carrier Package

TCP/IP: Transmission Content Protocol/Internet Protocol

TCT: Toroidal Current Transformer

TCV: Technology Characterization Vehicle

TDD: Time Division Duplex

TDDB: Time Dependent Dielectric Breakdown

TDM: Time Division Multiplexing

TDMA: Time Division Multiple Access

TDR: Time Domain Reflectometry

TE1: see Terminal Equipment 1.

TE2: see Terminal Equipment 2.

Technology Buys: Purchases of advanced equipment by the semiconductor industry for developing next generation technologies and other R&D, as opposed to buying equipment in order to increase manufacturing capacity (capacity buys).

Teleaction Service: An ISDN service that provides telemetry service using slow packet speeds over the ISDN D channel. An example is the remote reading of electrical, water, and gas meters.

Telemetry: Transmission and collection of data obtained by sensing conditions in a real-time environment.

TEQFP: Thermally Enhanced Quad Flat Pack

Terminal: The device on a network that sends or receives data.

Terminal Adapter: A circuit that permits non-ISDN equipment to be connected to an ISDN line.

Terminal Equipment 1: Any type of equipment designed to be compatible with ISDN.

Terminal Equipment 2: Equipment that is not designed to be compatible with ISDN and that requires a terminal adapter (TA) to connect it to an ISDN line.

Terminal Equipment: Subscriber equipment connected to an ISDN line. There are two types, TE1 and TE2. TE1 equip-

ment is designed specifically to be used with ISDN. TE2 is pre-ISDN equipment that must be interfaced to the ISDN line by means of a terminal adapter (TA).

Terminal Program: A communications software package that controls an intelligent modem and performs other communications functions.

Tester: A piece of electronic equipment designed to test chips to check if they work and if so, how well (usually how fast) they work. Testers are usually specialized as either memory chip testers, digital logic chip testers, or analog chip testers, though some of the more sophisticated testers can deal with more than one of these groups.

TFM: Tamed Frequency Modulation

TFP: Thin Quad Flat Package

TFT LCD: Thin Film Transistor, Liquid Crystal Display

TGA: Thermogravimetric Analysis.

TGA: Time Gain Amplifier

TGC: Time Gain Compensation

THD+N: Total Harmonic Distortion plus Noise. An expression of the quality of the sound. For this measure, lower is better.

Thinwire Ethernet: see 10BASE-2.

TIA: Telecommunications Industry Association

Time Compression Multiplexing: A method of providing the appearance of full duplex communication over a single twisted pair half-duplex copper loop. Data are buffered at each end and sent across the line at double the subscriber data rate with the two ends taking turns. Also called ping pong multiplexing.

Time-Compression Modulation (TCM): see Time Compression Multiplexing.

TNC: Threaded Neil-Councilman Connector

Token: A unique bit pattern that controls which terminal has permission to transmit on a Token Ring network. See Token Passing.

Token Passing: A protocol that gives a terminal permission to transmit on a Token Ring LAN. A unique bit pattern, called a token, circulates around the ring from terminal to terminal. The terminal that possesses the token has permission to transmit.

Token Ring: A LAN standard, also known as IEEE 802.5, that connects a ring topology. Token Ring LANs operate at 4 Mb/s or 16 Mb/s.

Topology: The physical layout of a communications network. Some popular topologies are mesh, bus, ring, star, and point-to-point.

Touch Tone: see DTMF.

TP PMD: Twisted Pair, Physical Medium Dependent

TPG: Test Pattern Generator

TPQFP: Test Pad Quad Flat Pack

TQFP: Thin Quad Flat Pack

TQM: Total Quality Management

Track: Sometimes called resist track. A common name for a spin coater.

Transfer Mode: Into fixed-length cells consisting of an identification header field and an information field. The transfer rate is asynchronous in that the recurrence of cells depends on the instantaneously required bit rate.

Transmission Control Protocol/Internet Protocol: A packet-oriented data communication protocol, as used in the Internet.

Transparent Device: A device on a communications network that functions without making its presence known to the end terminals.

Transparent Transmission: A type of transmission used in BISYNC in which the receiving DTE ignores the contents of the text field. Transparent transmission is used to communicate non-text data where a data word in the text field could be confused with a control character.

Transport Layer: Layer 4 of the OSI Model. It defines standards that make the network transparent to the user.

Transmission: The encoding of information and its communication across a communications network.

Transmission Equipment: Telephone circuits that carry information from one subscriber to another and the electronic equipment that supports those circuits.

Tree Network: see Hierarchical Network.

TRP: Technical Reinvestment Program or Technology Reinvestment Project

Trunk: A telephone circuit that connects two telephone switches or two telephone company local offices.

TSAPI: Telephony-Services Oriented Application Programming Interface

TSMC: Taiwan Semiconductor Manufacturing Company

TSOP: Thin Small Outline Package

TSSOP: Thin Shrink Small Outline Package

TTL: Transistor-to-Transistor Logic

Tungsten: A metal commonly used to make the plugs used for connecting metal wires to one another or to the devices in integrated circuits. Tungsten is usually deposited by CVD, unlike almost all the other commonly used metals in semiconductor manufacturing which are generally deposited by sputtering. This makes it excellent for filling deep narrow holes such as the contact holes connecting the metal wires to each other and to the semiconductor devices in an integrated circuit.

TVG: Time Variable Gain

TVS: Transient Voltage Suppression

Twisted Pair: Two insulated wires, usually made from copper, that are twisted in a regular, six turns per inch spiral pattern used to connect most telephones. Also used as a medium by several local area networks.

Twisted-Pair FDDI: A new FDDI LAN standard that uses twisted-pair wire instead of fiber-optic cable as a communications medium. Twisted-pair FDDI is more economical, because it eliminates the expensive interface between each node and the fiber-optic cable.

Two-Wire Circuit: A communications circuit that uses a single pair of wires for both transmitted and received information.

Tx: Transmitter

TZ: Trans-Impedance (Amplifier)

-U-

U Interface: A twisted-pair ISDN subscriber loop that provides basic-rate access to the NTI reference point from the ISDN network.

UART: Universal Asynchronous Receiver/Transmitter

UHF: Ultra High Frequency

UNC: Universal Control Network

UNI: see User-to-Network Interface.

Uniformity: It is important that any given process affects all areas of the wafer equally. The measure of this is called the uniformity of the process. A common (though undesirable) occurrence is that center to edge non-uniformities occur. For example, the center of the wafer might get etched more rapidly than the edge, or the edge of a wafer might polish down more quickly than the center.

UPS: Uninterruptible Power Supply

USART: Universal Synchronous-Asynchronous Receiver Transmitter

USB: Universal Serial Bus. An external peripheral interface standard for communications between a computer and external peripherals over an inexpensive cable using biserial transmission. USB is standard on current (1999) Macintosh computers and is promoted by Intel as an option for the IBM PC, where it is supported by later versions of Windows 95.

USDC: United States Digital Cellular, or IS54, 850 to 950 MHz

User-to-Network Interface: An ATM interface that connects a terminal to an ATM switch. Also see Network-to-Network Interface.

UTC: Universal Time Code

UTP: Unshielded Twisted Pair

UTP-5: Unshielded Twisted Pair

UTQFP: Ultra Thin Quad Flat Pack

UTSOP: Ultra Thin Small Outline Package

-V-

V Interface: see V Reference Point.

V Reference Point: An ISDN electrical reference point in the telephone company central office switch that is located between the line termination (LT) and the exchange termination (ET).

V.21: An international 300 b/s full-duplex FSK modem standard. The North American version is Bell 103.

V.22: An international full-duplex 4PSK modem standard that operates at 1200 b/s and 600 baud. The North American version is Bell 212A.

V.22 bis: An international full-duplex QAM modem standard that operates at 2400 b/s and 600 baud.

V.32: 9600 kb/s @ 2400 Hz (Modem Expression/Type). Also, an international full-duplex QAM modem standard that operates at 9600 b/s and 2400 baud.

V.32 bis: An international full-duplex modem standard that operates at 14,400 b/s.

V.32 TURBO: V.32 b/s extension to 19.2 kb/s (Modem Expression/Type)

V.34: Official name for V.Fast. Also, an international full-duplex modem standard that operates at 28,800 b/s.

V.42: An error checking and correction standard protocol published by the CCITT that is used for modem communications.

V.42 bis: A data compression standard published by the CCITT that is used for modem communication.

V.90: Specifications covering modem protocol of 56 Kb/s.

V.FAST: 19.2 To 28.8 kb/s @ 3429 Hz. Also, an international full-duplex modem.

VA: Viterbi Algorithm

VAFC: VESA Advanced Feature Connector

VAR: Value Added Reseller

VAVI: VESA Advanced Video Interface

VCA: Voltage Controlled Amplifier

VCM: VESA Media Channel

VCOS: Visible Caching Operating System (AT&T Multi Media)

VCSEL: Vertical Cavity Surface Emitting Laser Diode

VDSL: see Very High Bit Rate Digital Subscriber Line.

VDI: Video Display Terminal

Very-high-bit-rate Digital Subscriber Line (VDSL): A proposed service that would provide a multi-megabit digital

service to small businesses and homes over 2-wire lines.
Typically 51 Mbps

VESA: Video Electronics Standards Association: Local Bus
Extension to the PC-AT Bus

VHDL: Very High Definition Language or VHSIC Hardware
Description Language

VHF: Very High Frequency

VHSIC: Very High Speed Integrated IC

Video Dial Tone: Generally, any service designed to deliver
video programs to consumers in their residences on demand.
More specifically, services, such as Asymmetrical Digital
Subscriber Line, that would provide video over existing tele-
phone local loops.

Virtual Circuit: see Virtual Connection.

Virtual Connection: A packet-switched data path between
two terminals that performs as if the two devices were by a
switched circuit.

VL bus: Local Bus

VLF: Very Low Frequency

VLIW: Very Large Instruction Word (RISC Term)

VLSI: Very Large Scale Integration. Refers to ICs that incorpo-
rate many thousands, or even millions, of transistors on a sin-
gle IC chip. ADI's DSP and system-level ICs are VLSI ICs.

VMC: VESA Media Channel

VME: Versabus Module Europe

VOC: Voice Of the Customer

VOD: Video On Demand (HFC Term)

VOST: VESA Open Set Top

VPSK: Variable Phase Shift Keying

VQFP: Japanese QFP With Very Fine Pitch, a.k.a., SQPF or FQFP. Also, Very Fine Pitch Quad Flat Pack or Very Small Quad Flat Package.

VR: Virtual Reality

VSF: Vestigial Sideband: Zenith's Version Of HDTV Transmission Method

VSD: Variable Speed Drive

VSLEP: Vector Sum, Linear Excited Predictive Coding, 8 KHz Data Rate, 68 Msec Delay

VSOP: Very Small Outline Package, Japanese MFP With Very Fine Pitch

VSWR: Voltage Standing Wave Ratio

VTQFP: Very Thin Quad Flat Package

VXCO: Voltage Controlled Crystal Oscillator

-W-

Wafer: A thin disc of semiconductor material, usually made of silicon, ranging in size from 4 inches to 8 inches in diameter, on which many semiconductor devices are fabricated at one time. The devices are subsequently separated into chips and assembled in individual packages.

Wafer Fab: Sometimes just called a fab. A facility used for wafer fabrication. Can also refer to the process of wafer fabrication.

Wafer Fabrication: That part of the IC manufacturing process that exposes a silicon wafer to numerous photolithographic and chemical vapor deposition manufacturing steps, and in the process builds up a series of extremely thin layers on the surface of the wafer to create an IC. This process is performed in a clean room environment.

WAN: Wide Area Network. Communications between a large number of variable devices, example, cell phones.

Wave Table: Scheme for generating sounds based on a lookup table of existing wave forms.

Wavelength: The color of light. A rule of thumb is that one must use a wavelength of light that is close to or smaller than the size of the feature one is trying to create in a photolithography process. Visible light (the rainbow) runs from wavelengths of about 0.4 microns (violet) to nearly 0.8 microns (red). The violet G-line wavelength of a mercury lamp is 0.44 microns and is used in photolithography for 0.65 micron semiconductor technologies and above. The ultra-violet I-line of a mercury lamp (0.36 microns) is currently used for 0.5 and 0.35 micron processes. To move to the 0.25 and 0.18 micron geometries of the next generation of semiconductors it will be necessary to move to a different light source - the excimer laser - with wavelengths in the deep ultra-violet range (0.25 microns for a krypton fluoride laser and 0.19 microns for an argon fluoride laser).

Wavelet: A mathematical algorithm that is used to efficiently compress and decompress the phase & frequency information that is contained in a transmitted signal.

WDM: Wavelength Division Multiplexing

Wet Cleaning: Cleaning of wafers by immersing them in chemicals such as acids. This can be done in sinks, spray tools (machines that work like dishwashers) or spin tools (machines that work like laundry machines).

Wet Etching: Etching away of layers on a wafer by immersion in a chemical bath.

WFAU: Wireless Fixed Access Unit

WFW: Windows For Workgroups

WGATVP: Work Group For Advanced TV Production

Wideband: see Broadband.

WIP: Work in Process. A term used to describe partially manufactured products. A company's inventory at any given time

can be divided into three categories: raw materials, WIP and finished goods.

Wire Bonding: The linking of a chip with the outside world.

This involves connecting each of the contact pads (fabricated on the chip) with the metal leads of the package by joining one end of a gold (or aluminum) wire to the pad and the other end to the corresponding lead. The bonds are formed by applying heat, pressure and/or sonic vibration. There are two main types of wire bonding - ball bonding and wedge bonding, of which ball bonding is more commonly used.

Wireless Local Loop (WLL): The idea of replacing the conventional twisted pair telephone service to the home with a low-cost wireless RF/cellular connection. Especially attractive in less developed countries which have not yet installed a copper local loop infrastructure, wireless technology is an efficient and affordable way of providing telephony services.

Wireless Telephony: see WLL.

WLAN: Wireless Local Area Network

WLL: Wireless Local Loop

WORM: Write Once Read Many

WPABX: Wireless Private Branch Exchange

WRAM: Window RAM

WWW: World Wide Web

WYSIWYG: What You See Is What You Get

-X-

X.25: An established packet-switched technology. X.25 is expected to be replaced by frame relay and ATM, although its robust error correction will continue to make it popular in areas where communications lines are noisy or unreliable.

X3T9.5: FDDI Standard, PMD (Physical Media Dependent), For Twisted Pair

X-Ray Stepper: A rule of thumb is that one must use a wavelength of light that is smaller than the size of the feature one is trying to create in a photo process. People have thought for years that the industry would have to abandon light and move to x-rays for patterning circuits as circuit dimensions inexorably shrank. The stepper manufacturers, however, kept applying their ingenuity, finding ways to use shorter wavelengths of light. At the 0.25 and 0.18 micron levels, excimer lasers working in the deep ultraviolet range of light are adequate, but there is a chance that x-ray steppers will finally have their day when semiconductor manufacturing moves below the 0.18 micron range (probably not for a few more years).

XBC: Transmit Buffer Controller (Port Controller)

XFCB IC Process: eXtra Fast Complementary Bipolar process. An extremely fast bipolar IC process that is well suited for high-speed, high-performance products like amplifiers and data converters.

-Y-

YAG: YTTIUM-Aluminum-Garnet (Solid State Laser 532 Nm)

YUV: Y = Luminence, U = & V = Chrominance Vectors

-Z-

z: Impedance

ZIP: Zig Zag In Line Package

-Numeric-

u-law: A North American standard for the non-linear digitization of voice. Also see A-law.

1149.1a: IEEE standard For boundary scan testing, a.k.a., JTAG.

1BASE-5 Ethernet: A version of Ethernet that operates a 1 Mb/s over twisted-pair wire. Also known as StarLAN. Not popular because of its slow speed.

2B+D: The Basic Rate Interface ISDN service that provides two 64-Kb/s circuit-switched B (bearer) data channels and one 16-Kb/s D (data) channel for signaling and low-speed packetized data.

23B+D: The North American ISDN Primary Rate Interface that provides 23 circuit-switched 64 kb/s B (bearer) channels and one 64 kb/s D (data) channel for signaling and packet-switched data.

2BIQ (2 binary, 1 quaternary): A pulse amplitude modulation scheme used to send high-speed digital signals over ordinary telephone wires in ISDN and HDSL services. The scheme uses four voltage levels, and each level represents a dibit (group of two bits).

30B+D: The European ISDN Primary Rate Interface that provides 30 circuit-switched 64 kb/s B (bearer) channels and one 64 kb/s D (data) channel for signaling and packet-switched data.

4B3T (4 binary 3 ternary): A line code in which groups of 4 binary bits are converted into three ternary symbols for transmission.

4DPSK: DPSK shifted 45 degrees, used by IS-54

802.11: Wireless LAN standard, 2.4 GHz

802.3: 10BASE-T, Ethernet over unshielded twisted pair standard

802.9a: Isochronous Ethernet

802.X: The Institute of Electrical and Electronic Engineers (IEEE) committee that developed standards defining some networks including: 802.3 Ethernet, 802.4 Token Bus, 802.5 Token Ring, 802.6 metropolitan area networks, and 802.9 integrated data and voice.

10BASE-2 Ethernet: A version of Ethernet that uses thin coaxial cable and operates at 10 Mb/s with a maximum cable length of 185 meters. Also called Cheapernet or Thin-wire Ethernet.

10BASE-5 Ethernet: A version of Ethernet that operates at 10 Mb/s and uses thick coaxial cable with a maximum network length of 500 meters.

10BASE-T Ethernet: A version of Ethernet that operates over twisted-pair wire at a speed of 10 Mb/s. 10BASE-T networks with more than two terminals must use an Ethernet hub and a star topology.

16-bit Word: 16-bit short data word; uses one 16-bit memory column.

32-bit Word: Standard 32-bit data word; uses two 16-bit memory columns.

48-bit Word: Usually implies instruction word, but may also imply 48-bit instructions and 40-bit extended-precision data values that are transferred within 48-bit words; 48-bit words use three 16-bit memory columns.

